TOOELE ARMY DEPOT

Tooele, Utah

Monitoring Well C-48F Completion Report Phase II RFI Groundwater Investigation

Contract Number: GS-10F-0179J

US Army Corps of Engineers®

Submitted to:

U.S. Army Corps of Engineers

Sacramento District

February 2006

PARSONS

KLEINFELDER

Prepared by:

PARSONS and KLEINFELDER

Salt Lake City, Utah

MONITORING WELL C-48F COMPLETION REPORT
PHASE II RFI GROUNDWATER INVESTIGATION
TOOELE ARMY DEPOT
TOOELE, UTAH

Contract Number: GS-10F-0179J

Prepared for:

Sacramento District

January 2006

A Report Prepared for:

Ms. Maryellen Mackenzie
CESPK-ED-EB
USACE Sacramento District
Environmental Section
1325 J Street
Sacramento, California 95814-2922

MONITORING WELL C-48F COMPLETION REPORT
PHASE II RFI GROUNDWATER INVESTIGATION
TOOELE ARMY DEPOT
TOOELE, UTAH

Contract No.: GS-10F-0179J
Kleinfelder File No.: 48743.1B
Parsons Job No.: 744139

Prepared by:

Matt Ivers, P.G.
Staff Geologist
KLEINFELDER

Reviewed by:

Richard Jirik, P.G.
Senior Hydrogeologist
PARSONS

Ed Staes, P.G.
Project Manager
PARSONS

KLEINFELDER, INC.
849 West Levoy Drive, Suite 200
Salt Lake City, UT 84123
(801) 261-3336

PARSONS
406 West South Jordan Parkway, Suite 300
South Jordan, UT 84095
(801) 572-5999

February 2006

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

APPENDICES

ABBREVIATIONS AND ACRONYMS

µg/L ..... micrograms per liter
ASTM ..... American Society for Testing Materials
bgs ..... below ground surface
BRAC ..... Base Realignment and Closure
btoc ..... below top of casing
CTC ..... carbon tetrachloride
EPA ..... Environmental Protection Agency
gpm ..... gallon per minute
IWL ..... Industrial Wastewater Lagoon
MCL ..... maximum contaminant limit
NAD ..... North American Datum
NEB ..... Northeastern Boundary Plume
NGVD ..... National Geodetic Vertical Datum
NTU ..... nephelometric turbidity unit
NPL ..... National Priorities List
PCE ..... tetrachloroethylene
PDB ..... passive diffusion bag
PID ..... photoionization detector
ppm ..... parts per million
PVC ..... polyvinyl chloride
RCRA ..... Resource Conservation and Recovery Act
RFI ..... RCRA Facility Investigation
STL ..... Severn Trent Laboratories
SWMU ..... Solid Waste Management Unit
TCE ..... trichloroethene
TEAD ..... Tooele Army Depot
UAC ..... Utah Administrative Code
UID ..... Utah Industrial Depot
USACE ..... United States Army Corps of Engineers
USCS ..... Unified Soil Classification System
VOA ..... volatile organic analysis
VOC ..... volatile organic compound

1. INTRODUCTION

This report contains detailed information regarding the drilling, construction, development, and sampling of groundwater monitoring well C-48F, located within the Base Realignment and Closure (BRAC) parcel on Tooele Army Depot, Utah (TEAD). This report was prepared for the U.S. Army Corps of Engineers (USACE), Sacramento District, under Contract GS-10F-0179J, on behalf of TEAD by Kleinfelder, Inc., (Kleinfelder) and Parsons in Salt Lake City, Utah.

TEAD is an active military facility located approximately 35 miles southwest of Salt Lake City, Utah (Figure 1.1) and it has been in operation since 1942. TEAD has been a primary storage, maintenance, and disposal facility for conventional munitions since its inception. Due to impacts to groundwater quality resulting from this activity, TEAD was added to the National Priorities List (NPL) under the federal Superfund program in October 1990.

1.1 BACKGROUND INFORMATION

Historical wastewater discharged to the unlined Industrial Wastewater Lagoon (IWL) at TEAD resulted in a large impacted groundwater plume beneath the eastern portion of the Depot. A large number of monitoring wells, piezometers, extraction wells, and injection wells have defined a trichloroethene (TCE) plume along downgradient, northern, and western extremes of the Depot. This occurrence of impacted groundwater was designated the Main Plume.

In 1986, TCE was detected in an offsite production well located north of the Industrial Area, approximately 5,000 feet northeast of the IWL. In 1994, well C-10 was installed at the northeastern boundary of the Depot. TCE was detected at a concentration of approximately 240 micrograms per liter (µg/L) in groundwater sampled from well C-10, located directly across the road from the impacted offsite production well (Kleinfelder, 1998).

Additional groundwater investigations were conducted to further assess the nature and extent of groundwater contamination at the northeastern boundary of TEAD. These additional investigations indicated that the contamination in well C-10 and the adjacent offsite production well had likely originated from a source different from that attributed to the Main TCE plume. Thus, two plumes of groundwater contamination were indicated. This second, more easterly plume, was designated the Northeastern Boundary (NEB) Plume. The oil-water separator at Building 679 in the former industrial area (now the privately owned Utah Industrial Depot [UID]) was identified as a major source of this plume (Kleinfelder, 2002).

A subsequent investigation was designed to define the approximate offsite extent of the NEB Plume. The plume, which is relatively narrow beneath the former industrial area, extends

approximately 16,000 feet downgradient (to the north) from the identified source at Building 679 (Parsons, 2003a). The installation of groundwater monitoring well C-48F was conducted in accordance with the Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Solid Waste Management Unit (SWMU) 58 Work Plan (Parsons, 2003b) and Work Plan Sampling and Analysis Plan Addendum 1 (Parsons, 2004) that were approved by the U.S. Army and the State of Utah prior to initiating fieldwork.

1.2 PROJECT PURPOSE AND SCOPE

Monitoring well C-48F is one of fifteen groundwater monitoring wells installed between September 2004 and September 2005 during the Phase II RFI at SWMU 58. SWMU 58 encompasses the source area and the area impacted by the Main and NEB TCE Plumes. Objectives of the groundwater investigative component of the Phase II RFI are to:

- Refine the vertical limits and lateral extent of the Main and NEB chlorinated solvent plumes;
- Further characterize the distribution of contaminants within the plumes
- Ascertain whether there are additional contaminant sources to the NEB Plume and assess their impacts to groundwater;
- Assess the risks to human health associated with the unmanaged (offsite) portion of the NEB Plume; and
- Refine the existing numerical groundwater flow and solute transport models with respect to fate and transport, in order to better predict the potential extent (stability) of the plume in the future.

Investigative efforts described in this completion report were supervised by a Kleinfelder State of Utah-registered geologist who was present for critical on-site activities. Before drilling began, a permit for well construction was obtained from the State of Utah Division of Water Rights. Copies of the Request and Authorization letters and the Driller's Start Card are included in Appendix A. Underground utility clearance was obtained through Blue Stakes Location Center and UID.

Monitoring well C-48F was drilled, constructed, developed, and sampled between July 28 and October 4, 2005. Drilling and construction activities were conducted by Layne Geoconstruction (Layne) of Salt Lake City, Utah. Following completion of the well, Layne submitted a Well Driller's Report, which is included in Appendix A. Well development and groundwater sampling were completed by Veolia Water North American Operating Services, LLC (Veolia Water), which operates the groundwater treatment plant at TEAD. Laboratory analyses were provided by Severn Trent Laboratories (STL) of West Sacramento, California, which is a State of Utah and

USACE-certified analytical laboratory. Down-hole geophysical logging was performed by RAS, Inc. (RAS) of Golden, Colorado.

Monitoring well C-48F is located in the SW ¼ of Section 30, T3S, R4W, Salt Lake Base and Meridian within the BRAC parcel at the north end of the UID. The well was installed along the northwest side of Jake Court, about halfway between the paint booth addition to Building 615 and the sandblast building (Figure 1.2).

C-48F was installed at this location for two primary reasons: 1) to provide a long-term water quality monitoring point just hydraulically upgradient of Building 615; and 2) obtain groundwater elevation data so that the hydraulic gradient and the groundwater flow direction in this part of the former industrial area could be refined.

A major sampling objective for this monitoring well was to assess whether a heretofore unrecognized upgradient contaminant source might be contributing significant TCE to groundwater at the Building 615 site. Another sampling-related goal was to characterize the vertical distribution of chlorinated solvent compounds beginning at the water table. Obtaining concentration data at the water table was deemed critical since Building 615 is considered a major source for continuing TCE contamination to groundwater.

2. DRILLING, SAMPLING, AND LOGGING METHODS

2.1 DRILLING

Groundwater monitoring well C-48F was drilled by Layne Geoconstruction of Salt Lake City, Utah, between July 28 and August 1, 2005 using a Becker AP-1000 percussion hammer drilling rig manufactured by Drill Systems. The AP-1000 advances a dual-walled 10-inch diameter drill pipe into the subsurface by means of a diesel-powered pile hammer. Circulating air is pumped down the space between the inner and outer walls of the drill rod to the drill bit, where formation cuttings are picked up and carried back through the center of the drill rod and out of the borehole as the air returns to the ground surface. Cuttings are separated from the discharging air by a cyclone. Dry cuttings were collected and spread on the ground around the well site whereas saturated cuttings were contained in 55-gallon drums pending analytical results.

2.2 SAMPLING OF DRILL CUTTINGS

Cuttings were observed continuously as they discharged from the cyclone and were collected in 1-quart bags and chip trays. The cuttings were collected and logged at 5-foot intervals or when significant changes in lithology occurred. Drive sampling in previous boreholes during this program was rarely successful due to refusal in coarse sediments and inability to predict where thin fine-grained layers would occur. Thus, a more accurate and complete borehole log resulted from continuous observation of cuttings from the cyclone.

Drill cuttings were logged using the American Society for Testing Materials (ASTM) Method D2488-00. The Unified Soil Classification System (USCS) was used for designating the various types of unconsolidated material encountered. Where a conflict between the two methods was identified, the ASTM convention took precedence. Color of the drill cuttings (when wetted) was noted by referencing the Munsell color chart system. Estimated percentages of gravel, sands, and fines; degree of roundness and lithology/mineralogy of any gravel clasts; moisture content; degree of cementation; and any other notable attributes were routinely recorded in the sample description. The Becker Hammer Drilling method allows for a maximum clast size of about 6 inches to pass through the drill pipe to the surface. While boulders and cobbles exceeding this dimension may occur over certain intervals, their percentages cannot be estimated.

Grab samples of drill cuttings were logged and screened for volatile organic compounds (VOCs) using an Environmental Instruments photoionization detector (PID). PID readings were also included on the boring log. PID readings from the grab samples from this boring ranged from 0.0 to 3.1 parts per million (ppm). A composite of these samples was submitted for VOC analysis, which was used to determine the proper means of disposal for cuttings from this borehole. Drill

cuttings were containerized in a roll-off bin, which was transported to the UID 90-day yard following completion of the boring pending analysis of the IRW characterization sample.

2.3 RECORD KEEPING

While on site, Kleinfelder's geologist maintained records of all activities in a bound field log book, on Daily Field Report forms, Drill Rig Inspection forms, Safety Meeting Forms, and Equipment Calibration Logs. Copies of these records are presented in Appendix B.

3. SUMMARY OF SUBSURFACE CONDITIONS

3.1 GEOLOGIC LOG

A Kleinfelder geologist was on site during drilling and sediment sampling in order to maintain a continuous geologic log of the subsurface conditions that were encountered. Lithologic descriptions and the geologist's observations were entered onto the geologic log. The geologic log of the cuttings that were sampled during drilling of monitoring well C-48F borehole is included in Appendix C as Plate C-1.

The geologic log indicates that the boring was drilled in unconsolidated valley fill sediments from the ground surface to a total depth of 380 feet below ground surface (bgs). Most of the subsurface sediments encountered were poorly graded sand and gravel with varying amounts of boulders (?), cobbles, silt, and clay. The majority of the coarse grained sediments consisted of sub-rounded to sub-angular clasts of quartzite and limestone that appeared water-worn. While some angular clasts were observed, these are likely products of the mechanical breaking caused by the percussion hammer drilling method. The coarser-grained sediments (i.e., gravels) are interpreted to have been deposited in a dynamic high energy depositional environment of coalescing alluvial fans. They are thought to represent one or more of several types of alluvial fan deposits, including debris flow, stream channel, sheetflood, and sieve, that have been defined (Collinson, 1978) based on depositional process, location on the fan, deposit morphology, degree of sorting and bedding, etc.

Horizons of less permeable fine-grained sediments were encountered at depths of 83-93, 104-108, 124-126, 130-142, 162-166, 191-193, 229-235, and 300-304 feet bgs as indicated on the geologic log. As per the coarser-grained sediments, those intervals comprised of a significant percentage of silt and/or clay probably are thought to have been deposited within the distal portions of the alluvial fan, in a playa lake and/or floodplain setting (Collinson, 1978).

The geologic log also indicates that some moderately cemented and strongly cemented zones were also encountered at depths of 197-198, 224-227, 244-246, 263-264, 268-269, 276-278, 281-282, 318-319, 325-326, and 334-336 feet bgs. The boring was terminated before bedrock was encountered.

Free water from the cyclone was first observed at approximately 367 feet bgs during drilling. The depth to water was measured at 351.66 feet below top of casing (btoc) by Veolia Water after the well was constructed and developed. That datum represents the potentiometric surface for the regional valley fill aquifer. Perched water was not encountered during drilling of monitoring well C-48F.

3.2 GEOPHYSICAL LOGS

As a secondary interpretive tool, down-hole geophysical logging of monitoring well C-48F was completed within the polyvinyl chloride (PVC) cased well following construction. Natural gamma ray (gamma) and induction electric (induction) logs were run simultaneously by RAS on September 10, 2005 using a combination gamma ray-induction tool manufactured by Century Geophysical Corporation of Tulsa, Oklahoma. The gamma and induction logs for this well are contained on Plates C-2a and C-2b in Appendix C. Data validation was attained via a repeat logging run of a selected stratigraphic interval within the well, which is also presented in Appendix C. .An interpretation of the downhole gamma and induction electric logs for C-48F is also included in this appendix as a multipage log. It references the geologic units that were documented during the logging of well C-48F.

The gamma logging technique measures the natural gamma emissions emanating from the formation surrounding the borehole. This radiation is released from nuclei of an unstable element decaying to a more stable element. Potassium-40 is the element responsible for most of the gamma radiation detected by the gamma ray probe. This element is very abundant in a number of rock-forming minerals, such as potassium feldspar, that weather to clays. Hence, for those clays derived from the breakdown of potassium-bearing minerals, as the clay content of the sediment increases the gamma ray response also increases. Thorium- and uranium-bearing minerals also produce a gamma ray response, but in most geologic environments, including the unconsolidated valley fill deposits at the project site, the potassium-40 isotope is most abundant. Conversely, the gamma response becomes progressively weaker as the quartz content of the sediment increases. A comparison of this and other monitor well boring logs with their respective gamma ray logs generally shows a very strong correlation between finer-grained, clay-rich units and gamma ray peaks. The measurement scale of the gamma-ray log is in API (American Petroleum Institute) units, accepted as the international reference standard that allows consistent comparisons to be made between a wide variety of gamma-ray counting devices.

The gamma ray response ranges between about 60 and 210 API units. However, the curve generally falls within the range of 70 to 110 API units, which is considered to approximate background. Responses above about 130 API units are considered to be anomalous, and to signify the presence of potassium-bearing illitic clays. Almost all of the gamma ray peaks above 130 API units can be correlated with clay-rich or –bearing zones. Notable exceptions include peaks at 117-120 and 341-344 ft bgs. The latter peak, at 210 API units, has no corresponding distinct induction log response. The absence of marked resistivity and conductivity anomalies suggests that gamma peak may signify a large clast(s) of igneous protolith that contains significant potassium feldspar and/or biotite. Conversely, a few clay-rich intervals such as the lean clay with gravel (CL) at 229- 237 appear to be lacking a perceptible elevated gamma signature.

The induction log measures the conductivity from high frequency alternating currents that are induced into the geologic formation, and is best suited where the formation is characterized by low to medium (less than 50 ohm-meters) resistivity values, the geologic medium exhibits medium to high porosity, and the open borehole was advanced using mud or air as the drilling fluid. Induction logging can be performed in boreholes cased with PVC, but not with steel pipe. Although the induction device measures conductivity, by convention the conductivity readings are converted to a resistivity curve when plotted on a down-hole log via a simple inverse relationship.

Three curves are shown on the induction logs that were run by RAS. They represent 1) an apparent conductivity ("ap-cond") curve designated by a dotted line (these readings have not been corrected for the temperature of the induction probe), 2) the direct conductivity (millimhos/meter) readings as designated by a dashed ("cond") curve on the plot (these readings have been corrected for the temperature of the probe), and 3) resistivity (ohm-meters) measurements derived from a conversion of the temperature-corrected conductivity readings that are depicted as a solid ("res") line on the induction log plot. Note that although the conductivity and resistivity curves appear to mimic one another, the scales for the two properties are reversed since their relationship is an inverse one.

The resistivity curve generally falls between about 11 and 15 ohm-meters, with the minimum and maximum values about 7 and 18 ohm-meters, respectively. The curve typically displays 2 to 3 ohm-meters fluctuations within the coarse-grained gravel-bearing units that are interpreted to reflect differences in porosity, clay content and grain size of the sediments. Only a few distinct resistivity highs are present; they are associated with gravel intervals. Note that there is no perceptible resistivity response for the numerous caliche-cemented zones that were encountered below about 195 ft in C-48F. The numerous resistivity lows, and associated conductivity highs are in response to clay-rich intervals.

Background for the temperature-corrected conductivity curve is about 60-85 millimhos/meter. The maximum conductivity reading is about 135 millimhos/meter. Virtually all of the conductivity anomalies are highs that are associated with clay-rich intervals. Distinct conductivity lows are rare. The best example, at 7 ft bgs, appears to mark a zone of higher gravel content within a well graded gravel with clay.

Note for C-48F an apparent vertical offset between some geophysical anomalies and the inferred source interval interpreted to have produced the response. This effect is a function of the percussion hammer drilling method, which typically returns the drill cuttings to the surface following a five-foot advancement of the dual-wall drill pipe, e.g., 100, 105, 110 ft bgs, rather than continuously as is the case with rotary drilling methods. As a result, the depths to distinct geologic features such as contacts and cemented zones must be estimated by the field geologist. Even if the geologist is at the cyclone when the drill cuttings are returned to the surface, the

depth estimate for contacts and other geologic features of note may be off by a few feet or more. Thus, where discrepancies exist between the geophysical and geologic boring logs concerning the actual depth(s) at which a distinct sediment unit or other geologic feature occurs, the geophysical log(s) will provide the best control.

3.3 HYDROSTRATIGRAPHIC SECTION

To aid in understanding the subsurface geology and water table configuration in the vicinity of this monitoring well boring, the geologic log for this well was included on a straight line cross section trending northwest-southeast over a distance of approximately 4,860 feet that is also defined by monitoring wells C-19, C-21, C-47F, and C-49 (Plate C-4). Wells C-19 and C-21 were projected onto this section. Projection distances are provided on the cross section. The location of this cross section (E – E') is shown on Plate C-3. Note that only cross section E – E' is provided in this well completion report, since it is the only section that is partially defined by that monitoring well.

No substantive effort has been made to date to correlate the numerous fine-grained and /or clay-rich units that have been logged in the four monitoring wells (C-19, C-47F, C-48F, and C-21) that are in close proximity to each other. It is surmised that even without the benefit of downhole induction and gamma logs for C-19 and C-21, many of the finer-grained units and possibly some caliche zones may be correlative between these four wells. A detailed review of the geologic boring logs for those four wells will be performed at a later time, and the findings will be presented in the Phase II RFI Report. Moreover, the geologic logs for nearby vertical profile borings I610-VPB003 and I610-VPB004 will also be used to refine the stratigraphic relationships in that area. Nevertheless, no attempt has or will be made to correlate the stratigraphy between C-49 and the aforementioned wells in the former TEAD industrial area due to the large distance (3,000+ ft) between them.

Difficulty in correlating distinct fine-grained units is to be expected, given that the unconsolidated valley fill within SWMU-58 was largely deposited in a dynamic high energy depositional environment of coalescing alluvial fans. Fine-grained units deposited under such conditions are characterized by limited thickness and areal extent. This observation appears to hold true for the project area as a whole, in addition to this portion of the former industrial area. Other factors that challenge efforts to correlate stratigraphic units include post-depositional erosion and sediment reworking, and the inclined depositional surface of the alluvial fans. They are treated in greater detail in earlier Phase II RFI well completion reports.

Finally, the same general comments presented above for fine-grained sediment deposits also apply to correlation of caliche-cemented zones. Unfortunately, little success has been achieved attempting to correlate caliche-cemented zones that occur primarily in the gravels. Ultimately,

the ability to correlate both fine-grained sediment units and cemented zones between monitoring wells in the project area may be contingent upon the quality of the downhole gamma and induction electric logs for those wells.

4. WELL CONSTRUCTION SUMMARY

4.1 CONSTRUCTION TECHNIQUES AND MATERIALS

During drilling of monitoring well C-48F, the 10-inch Becker Hammer drive casing was advanced to a depth of approximately 380 feet bgs. Well construction occurred on August 2 and August 3, 2005 inside the cased borehole. Three 10-foot sections of threaded, 4-inch diameter Schedule 40 PVC well screen with 0.010-inch wide slots and 35 10-foot sections of 4-inch diameter Schedule 40 PVC blank casing were assembled and lowered inside the drive casing to the bottom of the borehole. The screen extends from 349 feet to 379 feet bgs, and coincides with a well graded gravel with sand unit (GW). (The rationale for installation of 30-foot screens is provided below.) The bottom of the well was tagged at a depth of 379 feet bgs.

Silica sand (16-40) was added to the annulus between the PVC and the borehole in the interval adjacent to the well screen. To help minimize the risk of bridging and to confirm that the correct volume of sand was added, the sand was poured slowly into the annulus from the surface and continuously monitored until the top of the sand interval was approximately 3 feet above the top of the screen. The sand-pack interval was isolated from upper portions of the borehole with a 4-foot thick seal of bentonite clay pellets. The remaining annulus above the bentonite clay pellets was grouted to approximately 30 inches bgs with 30 percent solids bentonite slurry in accordance with Utah Administrative Code (UAC) R655-4-9.4.2. A well construction diagram is provided in Appendix D.

A decision was reached on July 28, 2005 to install 30-foot long screens in monitoring well C-48F (and C-47F) at Building 615, in lieu of the standard 20-foot screens, following discussions with the USACE project personnel regarding the recent water level data recorded for nearby monitoring wells. It was agreed to install the screen so that five feet were above the current potentiometric surface, and the remaining 25 feet were submerged. This design modification would allow C-48F to serve as a water table monitoring well so that the vertical distribution of chlorinated solvents could be evaluated beginning at or just below the water table. The collection of passive diffusion bag (PDB) groundwater samples starting at the regional water table was considered imperative given that both wells were installed in a significant source area for chlorinated solvents. The continued long-term decline of the unconfined valley fill aquifer in the project area was an additional justification for the 30-foot screens. Thus, it was concluded the additional length would provide some “insurance” for long term monitoring if that hydrograph trend continued unabated. After a consensus was reached between the USACE and Parsons on the well design, approval was obtained from the UDEQ via a conference call later that same day.

4.2 SURFACE COMPLETION AND SURVEY COORDINATES

Monitoring well C-48F was built with a flush mount surface completion owing to its location in a high-traffic area. The 4-inch PVC well casing is accessed from a 12-inch circular traffic rated well vault. The top of the well casing is 0.36 feet below the ground surface. The "F" designation in the well identifier signifies that the surface completion is flush with rather than aboveground. Concrete was used to anchor the well vault and build a 4-foot square by 18-inch thick pad around the finished well. The concrete pad was finished to slope away from the protective casing. A brass survey cap (monument) was embedded on the north side of the concrete pad. An as-built drawing of the flush mount surface completion is provided in Appendix D.

Ward Engineering Group of Salt Lake City, Utah, surveyed the well on November 30, 2005. Coordinates for the well locations are referenced to the North American Datum (NAD) 1983 Utah State Plane Central Zone and the elevation to the National Geodetic Vertical Datum (NGVD) 1929. Survey data are included in a table within Appendix D.

5. WELL DEVELOPMENT

Groundwater monitoring well C-48F was developed using swabbing, bailing, and pumping methods on August 9 and August 10, 2005. Development continued for 10 hours and 18 minutes until the turbidity of the water produced was less than five nephelometric turbidity units (NTUs). All development water was collected and contained for later disposal pending analytical results (see Section 7.3). Well development records are included in Appendix E.

5.1 SWABBING AND BAILING

Swabbing and bailing took place for approximately 4 hours and 21 minutes. Swabbing was done with a loose fitting surge block with an oversized rubber disk, slightly smaller than the inner diameter of the screen. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records (Appendix E). Approximately 120 gallons of water were removed from well C-48F by bailing during development.

5.2 PUMPING

After swabbing and bailing the well, development was completed using an electric submersible pump. The pump was lowered to the bottom of the screened interval at approximately 379 ft bgs and operated intermittently at rates ranging from 2.01 to 2.31 gallons per minute (gpm) for approximately 5 hours and 57 minutes. The referenced pumping rate was the maximum attainable for the 1-horsepower submersible Grundfos pump used and the depth to groundwater (351.66 ft btoc). During development pumping, the pump was periodically shut off and the water in the discharge piping was allowed to back-flush (surge) into the well. Pumping and periodic back-flush surging was continued until there was no noticeable increase in the discharge water turbidity. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records. A total of 756 gallons of groundwater were removed by development pumping. The final water quality parameters were: turbidity --1.51 NTU, temperature – 71.2^{o} F, pH – 7.42, and conductivity – 1689 µS/cm.

A drawdown-recovery test was performed during the pumping portion of the development of C-48F (Appendix E). A maximum drawdown of 0.09 ft was recorded after 2 minutes of pumping at 2 gpm. Although pumping continued for another 25 minutes, no further drawdown was recorded. Recovery to the original (pre-pumping) water level took about a minute once the pump was shutoff. The negligible drawdown is a function of the very low pumping rate, and the location of the pump intake adjacent to a well-graded gravel with sand (GW), a sediment type that intrinsically has a high hydraulic conductivity.

6. GROUNDWATER SAMPLING

6.1 SAMPLING METHODOLOGY

Monitoring well C-48F was sampled using passive diffusion bag (PDB) sampling techniques. PDB sampling is performed without purging and involves lowering a polypropylene bag filled with distilled water to a predetermined depth. Once in place, the water within the PDB sampler is allowed to equilibrate with the surrounding groundwater for two weeks. During this time, VOCs diffuse into the distilled water. The PDB sampler is then removed from the well and water is transferred into three pre-preserved 40 mL volatile organic analysis (VOA) vials.

Four PDB samplers were placed in monitoring well C-48F on September 16, 2005. One sampler was placed at a depth of 355 feet bgs (about 3 ft below the water table), one sampler was placed at a depth of 363 feet, one sampler was placed at a depth of 371 feet, and one sampler was placed at a depth of 379 feet. Four samples were deployed over the screened interval rather than the usual three due to the 30 foot screen length. The PDB samplers were retrieved from well C-48F and sampled on October 4, 2005. Groundwater samples collected from well C-48F were assigned sample numbers C-48FGW001, C-48FGW002, C-48FGW003, and C-48FGW004.

After the sample containers were filled, they were placed into an ice-chilled cooler and shipped overnight to STL, a State of Utah and USACE-certified analytical laboratory, for VOC analysis. Chain-of-custody forms were filled out and used to document the sampling dates, analytical parameters requested, and proper sample handling. Completed chain-of-custody forms and cooler receipt forms are included in Appendix F.

6.2 GROUNDWATER ANALYTICAL RESULTS

Analysis for VOCs was completed using U.S. Environmental Protection Agency (EPA) Method 8260B. The highest VOC detection in the groundwater from C-48F was TCE at the four depths; the highest TCE concentration (360 µg/L) was reported at 355 feet bgs. There is a marked decrease in TCE concentrations (360 to 300 µg/L) with increasing sample depth. In view of the observation that all of the screened interval in C-48F lies within the same unconsolidated sediment type: a well graded gravel with sand and silt, there is no apparent stratification. Thus, it is surmised that the decrease in TCE values with increasing depth reflect the concentration gradient due to advection and hydrodynamic dispersion.

1,1-dichloroethene was also detected at the four depths at similar concentrations (1.1 or 1.2 µg/L). Carbon tetrachloride (CTC), chloroform, cis-1,2-dichloroethene, and 1,1-dichloroethane were detected below the reporting limit in some or all of the four samples. No other VOCs were reported. The sampling results from monitoring well C-48F are summarized in Table 1.

Laboratory reports summarizing the results of groundwater analysis are included in Appendix F. Also included is an analytical quality control summary describing data quality issues.

TABLE 1

SUMMARY OF LABORATORY RESULTS

TOOELE ARMY DEPOT, UTAH

Analyte	Federal MCL (µg/L) 95 40CFR 141.11, 141.12, 141.61, & 141.62	Analytical Results (µg/L)			
Sample Number & Depth		C-48FGW001 (355 feet)	C-48FGW002 (363 feet)	C-48FGW003 (371 feet)	C-48FGW004 (379 feet)
1,1,1 Trichloroethane	200	ND	ND	ND	ND
1,1,2 Thrichloroethane	5	ND	ND	ND	ND
1,1 Dichloroethane	5	ND	ND	ND	ND
1,1 Dichloroethene		1.2	1.1	1.1	1.2
1,2 Dichloroethane	5	ND	ND	ND	0.13
1,2 Dichloropropane	5	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND
Carbon tetrachloride	5	0.39	0.44	0.33	0.36
Chloroethane		ND	ND	ND	ND
Chloroform	100	0.63	0.48	0.50	0.56
cis 1,2 Dichloroethene		0.10	ND	0.12	0.18
Ethylbenzene	700	ND	ND	ND	ND
m,p Xylene	10,000	ND	ND	ND	ND
Methylene chloride	3	ND	ND	ND	ND
Naphthalene		ND	ND	ND	ND
0 Xylene	10,000	ND	ND	ND	ND
Tetrachloroethene		ND	ND	ND	ND
Toluene	1,000	ND	ND	ND	ND
trans 1,2 Dichloroethene		ND	ND	ND	ND
Trichloroethene	5	360	340	320	300
Vinyl chloride	2	ND	ND	ND	ND

The elevated concentrations of TCE reported for this well confirm that groundwater has been impacted at this site. In conjunction with the analytical results for nearby well C-47F, the TCE data for C-48F strongly imply that Building 615 is the major source of the TCE found in groundwater beneath that facility. Aside from the elevated TCE concentrations reported for these two wells, the consistently high (>5,000 ppbv TCE) soil gas data obtained from the

sampling of proximal vertical soil gas wells I610-VSG013 and I610-VSG014 represent additional evidence supporting migration of chlorinated solvents through the vadose zone to groundwater. Moreover, using the soil gas results for VSG well I610-VSG013 and the Johnson-Ettinger vapor intrusion model (USEPA, 2004), a TCE concentration of 1,200 µg/L was calculated for groundwater at water table. This value compares favorably with the analytical results reported for the initial PDB sampling of C-47, which is within about 40 ft of I610-VSG013.

Finally, the elevated TCE contaminant levels reported in well C-48F are of the magnitude expected for a monitoring well (C-48F) that is slightly upgradient of a major contaminant source as represented by Building 615. The reported concentrations for this well are consistent with the hypothesis that there are no major sources of chlorinated solvents impacting groundwater directly upgradient of Building 615. This supposition is based on knowledge of historical use/operations for those buildings located upgradient (i.e., to the southeast) of Building 615, and also draws on the findings of the Phase I and II RFI shallow and deep soil gas sampling.

7. INSTALLATION RESTORATION WASTE

7.1 DECONTAMINATION METHODS

To help minimize the chance that non-dedicated equipment could cross-contaminate groundwater or drill cuttings at well C-48F, a rigorous decontamination program was followed. A decontamination station was constructed in the temporary UID RCRA 90-day yard (located south of building 614) that could accommodate the drill rig, drill pipe, and other equipment as needed. Decontamination of equipment was conducted with approved water from TEAD production well WW-3 using a steam cleaner/high-pressure washer. Equipment wash and rinse water were contained in a sump within the decontamination pad, and then pumped to a Baker tank in the UID 90-day yard where it was managed as suspect hazardous waste.

7.2 DISPOSAL OF DRILL CUTTINGS

Drill cuttings from both the unsaturated and saturated zone were directed from the cyclone into two 20-cubic yard roll-off bins (Parsons container #PARSNZ0520901 and #PARSNZ0521301). Because monitoring well C-48F was located in a known source area, all of the drill cuttings from this well were treated as suspect hazardous waste. This policy required that all cuttings be contained. Each roll-off bin was positioned adjacent to the Becker AP-1000 top allow for discharge of the cuttings and any groundwater from the cyclone directly into the roll-off bin. An IRW characterization sample of the unsaturated and saturated drill cuttings was collected every 5 ft during drilling. Upon completion of the borehole, these samples were composited to a single sample (IDW59) and submitted to the laboratory for analysis of VOCs.

Upon filling a roll-off bin or the completion of the drilling, the the roll-off bin at the drill site was transported by MP Environmental to the UID 90-day yard, to await the analysis of the IRW characterization sample. Lab results indicated VOCs were not detected in the cuttings from well C-48F. Following approval by the TEAD environmental management office, the two roll-off bins were transported by MP Environmental to the UID boneyard off of Industrial Loop road where the cuttings were dumped and spread over the ground. A copy of the laboratory results for the composite IRW sample of the drill cuttings is included in Appendix G.

7.3 DISPOSAL OF WASTEWATER

Groundwater that was extracted during drilling was released from the cyclone directly into the 20-cubic yard roll-off bin. After each roll-off bin had been transported to the UID 90 yard by MP Environmental, the free-standing water in the bin was pumped into a 6,500 gallon Baker tank

(Parsons container #PARSNZ0520801) by the Layne-Christensen drillers. Rinsate water from the decontamination of the drill rig was also pumped into that Baker Tank.

Water derived from the development of well C-48F was transported from the well site to the UID temporary 90-day yard by Veolia Water using a 1,000-gallon capacity polytank mounted on a dual axle trailer, and then pumped into the same 6,500-gallon capacity Baker Tank. (Parsons container #PARSNZ0520801).

The waste streams generated from drilling, installation, and development activities associated with well C-48F were commingled with drilling, development, and equipment rinse water derived from C-45 and C-47. Commingling of the waste streams from these wells was justified because the characteristics of the three waste streams were thought to be very similar. For IRW management purposes it was assumed the development and drilling water from these wells would be impacted by TCE, trace amounts of CTC, and possibly chloroform

The Baker Tank (Parsons container #PARS*NZ052080*) was closed on August 18, 2005 and sampled on August 23, 2005. The sample, IDW61, was analyzed for VOCs. The Chains-of-Custody and laboratory report for this sample are presented in Appendix H. This sample contained 48 µg/L TCE, 0.13 µg/L chloroform, 0.31 µg/L naphthalene, and 0.44 µg/L toluene. The waste stream was designated F001 and F005 hazardous due to the presence of TCE. The detection of naphthalene and toluene eliminated the TEAD Groundwater Treatment Plant (GWTP) as the preferred option for treatment/disposal, because that facility is not permitted to treat waste containing detectable amounts of naphthalene. Instead, the wastewater was transported in a 5,000-gallon tanker to Clean Harbors' Grassy Mountain disposal facility for solidification and landfilling on September 20, 2005 utilizing Clean Harbors' waste material profile #CH91899B. MP Environmental provided the tanker; the waste was shipped under hazardous waste manifest #P5013. The source(s) of the naphthalene and toluene is unknown. It is speculated that these constituents might have been derived from rinsate generated on the decontamination pad. Copies of the disposal recommendations memo and TEAD's authorization to dispose off-site can be found in Appendix H.

8. REFERENCES

Collinson, J.D. 1978. Alluvial Sediments, in Reading, H.G., ed., Sedimentary Environments and Faces: Elsevier, New York, pp. 15-60.

Kansas Geological Survey. 2005. http://www.kgs.ku.edu/PRS/ReadRocks/GRLog.html.

Kleinfelder. 1998. Northeast Boundary Groundwater Investigation Report of Findings (Vol. I), Tooele Army Depot, Tooele, Utah. Salt Lake City.

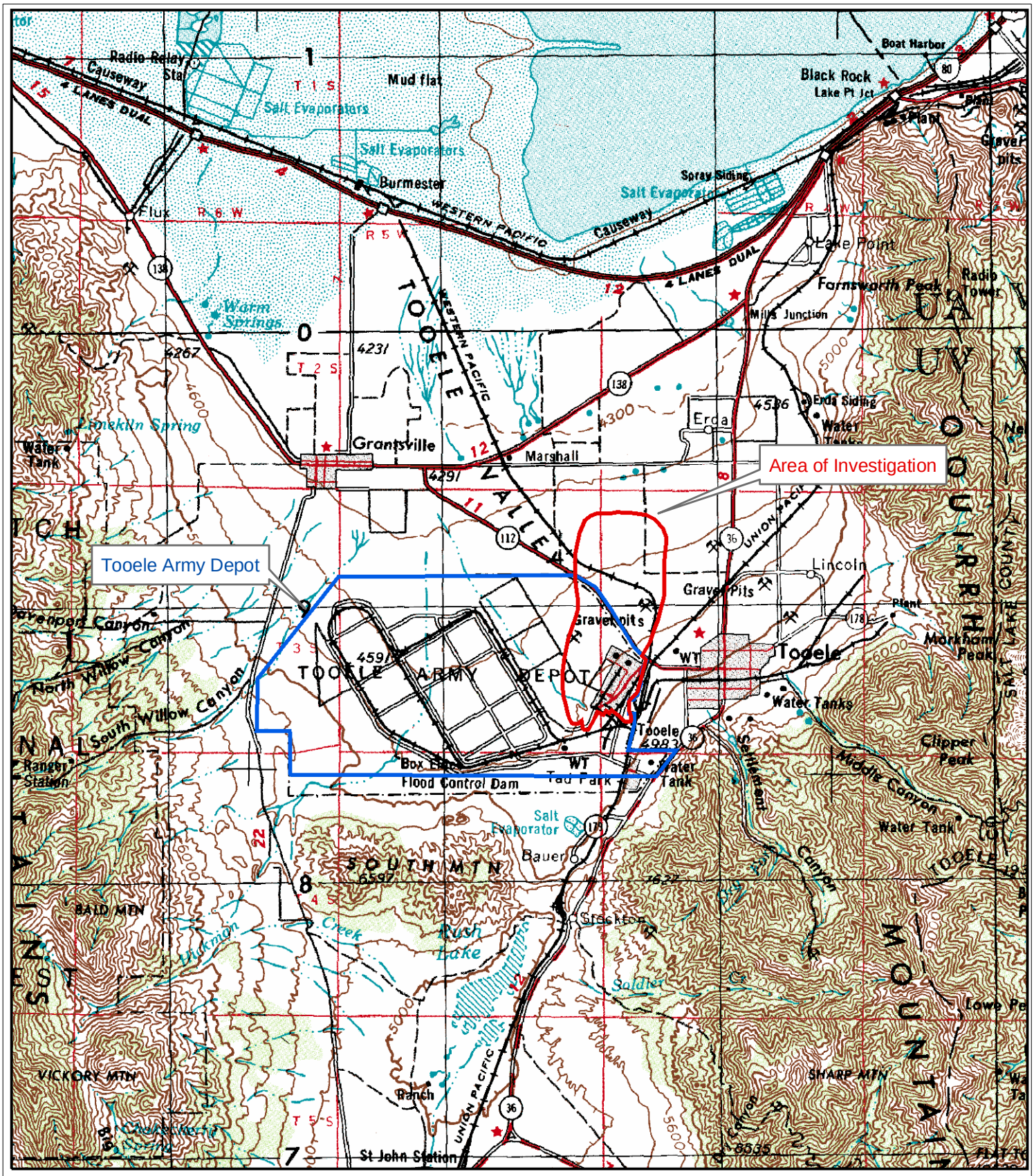
Kleinfelder. 2002. Final Phase I RCRA Facility Investigation Report for SWMU-58 for Tooele Army Depot, Tooele, Utah. Salt Lake City.

Parsons. 2003a. Final Addendum to Phase I RCRA Facility Investigation Report for SWMU 58: Groundwater Investigation – Offsite Portion of Northeast Boundary Area. Tooele Army Depot, Utah. August.

Parsons. 2003b. Final Phase II RCRA Facility Investigation SWMU-58 Work Plan for Tooele Army Depot, Tooele, Utah.

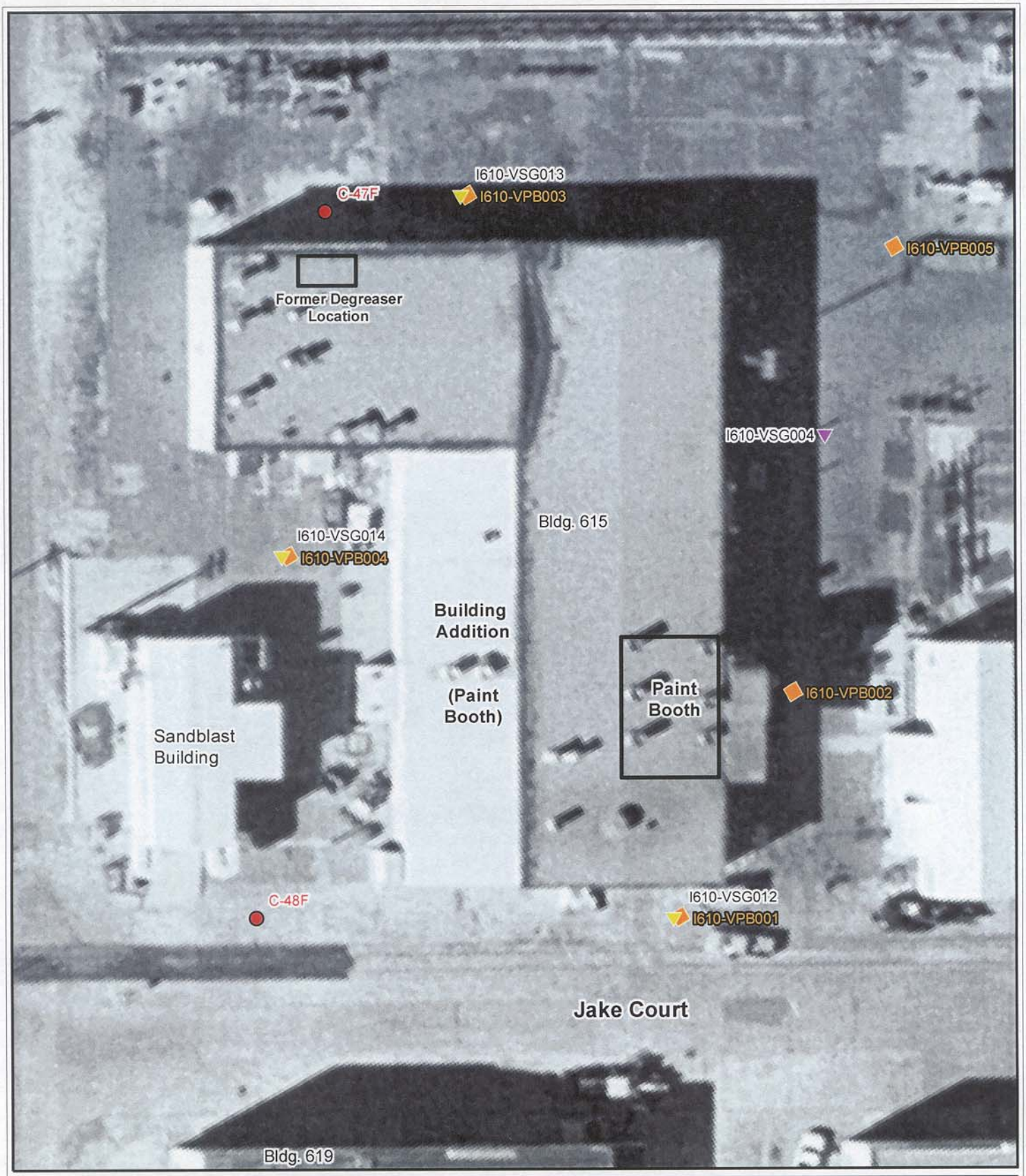
Parsons. 2004. Final Phase II RCRA Facility Investigation SWMU-58 Work Plan, Sampling and Analysis Plan, Addendum 1 for Tooele Army Depot, Tooele, Utah.

Welenco. 1996. Water and Environmental geophysical Well Logs: Volume 1—Technical Information and Data, 8th edition.



w:\tooele\maps\well_comp_report_sept2005\Loc_Map.mxd 11/28/05

PARSONS



LEGEND

PHASE I RFI

- Vertical Soil Gas Well

PHASE II RFI

- Vertical Profile Boring
- Vertical Profile Boring Converted to Vertical Soil Gas Well
- Groundwater Monitoring Well

SWMU 58
PHASE II RFI
TOOELE ARMY DEPOT
TOOELE, UTAH

0 40 Feet

N

FIGURE 1.2
VERTICAL PROFILE BORING, VERTICAL SOIL GAS WELL, AND GROUNDWATER MONITORING WELL LOCATIONS IN THE VICINITY OF BUILDING 615

w:\tooele\maps\well_comp_report_sept2005\fig_1_2_bldg_615.mxd 2/23/06

PARSONS

APPENDIX A

UTILITY CLEARANCE FOR WELLS [redacted] C-47, 48, & 49

(208-2100)

CALLED BLUESTAKES ON WEDNESDAY, JULY 20th, 2005 AND SPOKE WITH CORY [redacted] (pH: 208-2100)

RE: UTILITY CLEARANCE FOR GW MONITORING WELLS C-47, C-48, & C-49.

MEET TIME @ 9:00AM ON FRIDAY, JULY 22nd, 2005

TICKET VALID FROM WEDNESDAY JULY 27th, 9AM TO AUGUST 3rd, 9:00AM

TICKET #

C520105**02** ISSUED FOR CLEARANCE

TORY OF THE STAKE LOCATING CENTER CLEARED TWO SITES AT BLDG 615 ON BEHALF OF QWEST & UTAH POWER, SHORTLY AFTER 9:00 AM. 2 GUYS FROM TOOELE CITY SHOWED UP FOR BLUESTAKES MEET BUT ONCE THEY FOUND OUT BOTH SITES WERE LOCATED WITHIN UID THEY LEFT, AS UID HAS RESPONSIBILITY FOR WATER & SEWER WITHIN UID.

LEE FROM QUESTAR GAS CALLED ME ABOUT 8:30 AM & SAID HE COULDN'T MAKE THE 9:00 AM MEET TIME. WE RESCHEDULED FOR LATER IN THE DAY. HE CAME BY ABOUT 11:00 AM. MARKED GAS LINE GOING FROM MOTOR TO STREET AT THE SAND BLAST BLDG AT THE CORNER OF DAVENPORT AND 3rd STREET. HOWEVER, HE IS NOT RESPONSIBLE (AND DID NOT MARK) THE GAS LINE RUNNING BETWEEN THE SAND BLAST BLDG (DIRECTLY SOUTH OF BLDG 615) AND BUILDING 615. [redacted] HE CLEARED THE ALTERNATE ON THE NW SIDE OF BUILDING 615

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069 • www.parsons.com

July 11, 2005

State of Utah
Department of Natural Resources
Division of Water Rights
1594 West North Temple
Suite 220
P.O. Box 146300
Salt Lake City, Utah
84114-6300

Attn: Ross Hanson

Subject: Request for authorization to drill three groundwater monitoring wells for the Phase II RCRA Facilities Investigation at Tooele Army Depot

Dear Sir:

Parsons, on behalf of Tooele Army Depot (TEAD), requests authorization from the Division of Water Rights (DWR) to drill and install thee (3) groundwater monitoring wells within the Utah Industrial Depot northeast of TEAD and west of Tooele City (see attached table and map figure). Preparations are in progress to drill the well starting on or after July 25th and finishing by August 31st, 2005.

Each well boring will be advanced by a State of Utah licensed well driller using percussion hammer drilling to a maximum depth of about 400 ft. As per other C-series monitoring wells constructed during this program, the wells will be constructed using four (4) inch diameter Schedule 40 PVC, will extend up to approximately 40 ft below the regional water table, and a 20-ft 10- or 20-slot PVC well screen will be installed either across the regional water table or over the bottom 20 ft of the well.

If you have any questions or concerns please contact me at (801) 572-5999.

Written authorization should be mailed to Larry McFarland, SJMTE-CS-EO, 1 Tooele Army Depot (Building 8), Tooele, Utah 84074. His work phone is (435) 833-3235.

Sincerely,

Richard Jirik

Richard Jirik, R.G., P.G.
Senior Hydrogeologist
Parsons

DIVISION OF WATER RIGHTS
REQUEST FOR NON-PRODUCTION WELL CONSTRUCTION
(for wells deeper than 30 feet)

Well Type (check one): Provisional ( ) Monitor (X) Cathodic Protection ( ) Heat Exchange ( )

Applicants Name: TOOELE ARMY DEPOT

Mailing Address: SIOTE-CO-EO (BLDG 8)
TOOELE ARMY DEPOT TOOELE, UTAH 84074

Contact Person: MR. LARRY MCFARLAND Phone: (435) 833-3504

Proposed Start Date: JULY 25, 2005 Anticipated Completion Date: SEPT 30, 2005

Well Drillers License No: 215 Proposed No. of Wells: 3

PROPOSED LOCATION OF WELLS: County: TOOELE

NO./SQ. DISTANCE (feet)	EAST/WEST DISTANCE (feet)	SECTION CORNER	SECTION	TOWNSHIP	RANGE	BASE	DIAMETER (inches)	DEPTH (feet)
N1000	W1300	W4	15	2S	1W	SL	2	100

Use back of form or additional paper if more room is needed

EXPLANATORY: REFER TO ACCOMPANYING TABLE FOR INFORMATION ON THE PROPOSED WELLS.

Richard Jinick (PARSONS) FOR LARRY MCFARLAND
Signature of Applicant

JULY 12, 2005
Date

FOR OFFICE USE ONLY

Date of Request: *Approval Date:*

Approved by: *Provisional/Monitor Well No.*

Water Right Number (if available):

[redacted] ***Request for Non-Production Well*** [redacted]

c-47, 48949 Cf: File-Restoration Larry McFarland TAD 7/20

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Water Rights

JON M. HUNTSMAN, JR.
Governor
GARY R. HERBERT
Lieutenant Governor

MICHAEL R. STYLER
Executive Director

JERRY D. OLDS
State Engineer/Division Director

TOOELE ARMY DEPOT
SIOTE-CO-EO (BLDG 8)
TOOELE ARMY DEPOT
TOOELE UT 84074

July 15, 2005

Dear Applicant:

RE: MONITOR WELL#: 0515005M00

Reference is made to your request to drill 3 MONITOR WELL(S). The anticipated drilling depths will exceed the minumum regulated and reporting depth of 30 feet, thereby requiring permission from the Division of Water Rights to proceed with this project.

The specifications outlined in your well project request dated July 15, 2005, meet the State Engineer's requirements and permission is **HEREBY GRANTED.** Therefore, this letter is your authorization to proceed with the construction of the well(s) in accordance with those specifications and with respect to the following provisions:

1) Small diameter casing is to be used in the construction of the well(s) and no more water is to be diverted than is necessary to determine the quality of the ground water by obtaining representative samples as required by the project.

2) The well(s) must be drilled by a currently licensed Utah driller and must be drilled in a manner consistent with the recommended construction standards cited in the Utah State Administrative Rules for Well Drillers.

3) The enclosed Driller (START) Card form must be given to the licensed driller for his submittal prior to commencing well construction. The other enclosed form is the 'Applicant Card.' It is **YOUR RESPONSIBILITY** to sign and return this Applicant Card form to our office upon well completion.

4) If complete information is not available in the initial application, it is the **APPLICANT'S RESPONSIBILITY** to provide, upon completion, descriptive locations of the wells referenced by course and distance from established section corners, *e.g. North 565 feet and West 1096 feet from the SE corner of Section 35, T2S, R5W, SLB&M.*

5) At such time as the well(s) are no longer utilized to monitor ground water and the intent of the project is terminated, the well(s) must be temporarily or permanently abandoned in a manner consistent with the Administrative Rules.

NOTE: Please be aware that your permission to proceed with the drilling under this authorization expires January 15, 2005.

Sincerely,

S. Ross Hansen

Ross Hansen, P.E.
Regional Engineer

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069 • www.parsons.com

August 12, 2005

State of Utah
Department of Natural Resources
Division of Water Rights
1594 West North Temple
Suite 220
P.O. Box 146300
Salt Lake City, Utah
84114-6300

Attn: Ross Hanson

Subject: Amended locations for groundwater monitoring wells C-47, C-48, and C-49 at the Utah Industrial Depot, Tooele, Utah (DWR monitor well # 0515005M00)

Dear Sir:

Parsons, on behalf of Tooele Army Depot (TEAD), submitted a request dated July 11, 2005 for authorization from the Division of Water Rights (DWR) to drill and install thee (3) groundwater monitoring wells within the Utah Industrial Depot northeast of TEAD and west of Tooele City (see attached table and map figure) as part of the Phase 2 RCRA Facilities Investigation at the Tooele Army Depot. The request was granted by the DWR in a letter to TEAD dated July 15, 2005. The purpose of this correspondence is provide the DWR with updated locations for all three wells currently under construction (see accompanying table and map). Monitoring well C-48 will remain within the UID, but the location of C-49 has been moved onto TEAD. Well drilling and construction specifications remain as described in our request of July 11th.

If the DWR needs to issue new start cards based on the revised locations presented here, they should be sent to Larry McFarland, SJMTE-CS-EO, 1 Tooele Army Depot (Building 8), Tooele, Utah 84074. His work phone is (435) 833-3235.

If you have any questions or concerns please contact me at (801) 572-5999.

Sincerely,

Richard Jirik

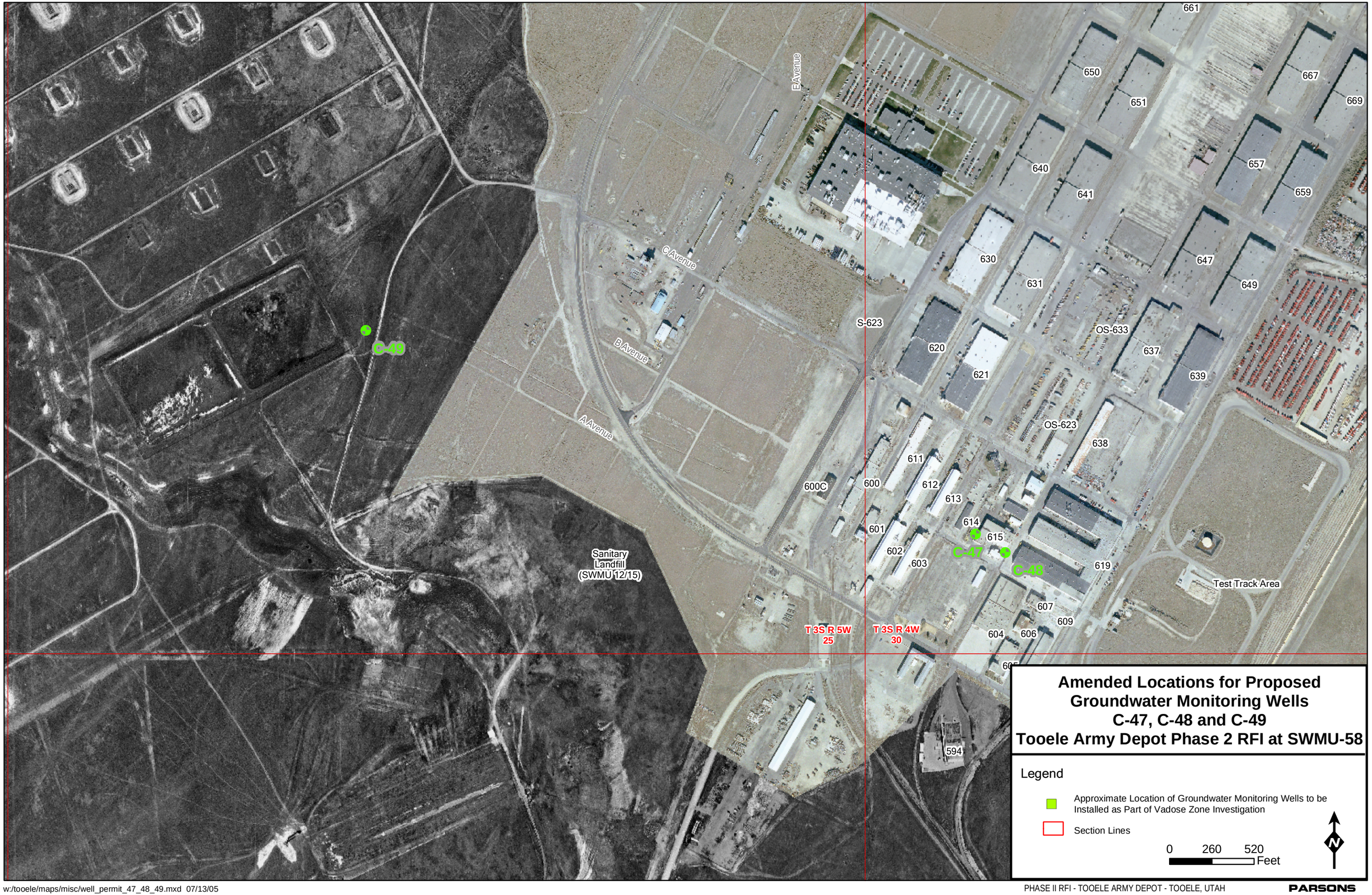
Richard Jirik, R.G., P.G.
Senior Hydrogeologist
Parsons

Cc: L. McFarland
C. Cole

REVISED LOCATION DATA FOR PROPOSED GROUNDWATER MONITORING WELLS C-47, C-48, & C-49
TOOELE ARMY DEPOT and UTAH INDUSTRIAL DEPOT
PHASE II RFI @ SWMU 58, TOOELE ARMY DEPOT

		-proposed well location-		-referenced section corner-		-well location relative to section corner-		LAT/LONG								
Well Identifier	-general location-	State Plane (northing)	State Plane (easting)	State Plane (northing)	State Plane (easting)	North/South Distance (feet)	East/West Distance (feet)	Latitude	Longitude	Section Corner	Section	Township	Range	Base	Diameter (inches)	Depth (feet)
C-47	Bldg 615 @ UID	7360557	1404815	7359821	1404137	North 740	East 670	40 31'24.79833" N	112 20'48.5677" W	SW	30	3S	4W	SL	4	370
C-48	Bldg 615 @ UID	7360446	1405000	7359821	1404137	North 624	East 850	40 31'23.70023" N	112 20'48.55407" W	SW	30	3S	4W	SL	4	340
C-49	TEAD	7361812	1401063	7359821	1404137	North 1956	West 3018	40 31'36.82295" N	112 21'39.71010" W	SW	30	3S	4W	SL	4	380

The state plane coordinates provided in this table for proposed monitoring wells C-47 and C-48 were derived from georeferenced imagery of the Utah Industrial Depot. Coordinates for proposed well C-49 were determined from a site visit to the location.



Amended Locations for Proposed Groundwater Monitoring Wells C-47, C-48 and C-49 Tooele Army Depot Phase 2 RFI at SWMU-58

Legend

- Approximate Location of Groundwater Monitoring Wells to be Installed as Part of Vadose Zone Investigation
- Section Lines

0 260 520 Feet

N

w:/tooele/maps/misc/well_permit_47_48_49.mxd 07/13/05

PHASE II RFI - TOOELE ARMY DEPOT - TOOELE, UTAH

PARSONS

APPLICANT CARD for Monitor WELL#: 0515005M00

IMPORTANT: THIS CARD MUST BE COMPLETED, SIGNED AND RETURNED BY THE WELL OWNER/APPLICANT AS SOON AS THE WELL IS DRILLED BY A LICENSED UTAH WATER WELL DRILLER.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT

MAILING ADDRESS: SIOTE-CO-EO (BLDG 8). TOOELE ARMY DEPOT. TOOELE UT 84074

PHONE NUMBER:

WELL LOCATION: You are authorized to drill 3 Monitor Wells. SEE BELOW.

WELL UTM COORDINATES:

WELL ACTIVITY: NEW (X) REPAIR ( ) REPLACE ( ) ABANDON ( )
CLEAN ( ) DEEPEN ( )

WELL COMPLETION DATE:

NAME OF DRILLING COMPANY/LICENSEE:

Larry McFarland 7-25-05

Owner/Applicant Signature Date

***COMPLETE, SIGN AND RETURN THIS PORTION UPON FINAL WELL COMPLETION - DO NOT GIVE THIS CARD TO LICENSED WELL DRILLER - YOU MUST RETURN IT.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

COMMENTS:

MONITOR WELL LOCATIONS:
(1) N 865 E 780 from the SW corner, S30 T 3S R 4W SLBM
(2) N 4134 E 3159 from the SW corner, S30 T 3S R 4W SLBM
(3) N 2047 W 455 from the SE corner, S25 T 3S R 5W SLBM

START/APPLICANT CARD INSTRUCTIONS: First, for each well, you must give a Driller (Start) Card to the licensed driller with whom you contract to construct the well. Second, it is your responsibility to sign and return this Applicant Card to this office immediately after completion of the well. **CAUTION: There may be local health requirements for the actual siting of your well. Please check with the proper local authority before construction begins. See the enclosed sheet addressing construction information.**

DRILLER (START) CARD for Monitor WELL#: 0515005M00

IMPORTANT: THIS CARD MUST BE RECEIVED BY THE DIVISION OF WATER RIGHTS PRIOR TO THE BEGINNING OF WELL CONSTRUCTION -- REQUIRED ONLY FOR WELLS DEEPER THAN 30 FT.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT

MAILING ADDRESS: SIOTE-CO-EO (BLDG 8). TOOELE ARMY DEPOT. TOOELE UT 84074

PHONE NUMBER:

WELL LOCATION: You are authorized to drill 3 Monitor Wells. SEE BELOW.

WELL UTM COORDINATES:

WELL ACTIVITY: NEW (X) REPAIR ( ) REPLACE ( ) ABANDON ( )
CLEAN ( ) DEEPEN ( )

For surface seals in unconsolidated formations (clay, silt, sand, and gravel), will you be using a temporary conductor casing or other formation stabilizer (e.g., drilling mud) in the surface seal interval to maintain the required annular space?

YES or NO (Circle one).

Answering 'NO' suggests that you will be placing the surface seal in an open and unstabilized annular space, which may require onsite inspection of seal placement by the State Engineer's Office.

PROPOSED START DATE:

PROJECTED COMPLETION DATE:

LICENSE #: LICENSEE/COMPANY:

Licensee Signature Date

NOTICE TO APPLICANT: THIS CARD IS TO BE GIVEN TO A UTAH LICENSED WATER WELL DRILLER FOR SUBMITTAL TO THE DIVISION OF WATER RIGHTS PRIOR TO WELL CONSTRUCTION.
STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

MONITOR WELL LOCATIONS:

(1) N 865 E 780 from the SW corner, S30 T 3S R 4W SLBM
(2) N 4134 E 3159 from the SW corner, S30 T 3S R 4W SLBM
(3) N 2047 W 455 from the SE corner, S25 T 3S R 5W SLBM

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 0515005M00 WIN: 34486

Owner *Note any changes*

TOOELE ARMY DEPOT
SIOTE-CO-EO (BLDG 8)
TOOELE ARMY DEPOT
TOOELE UT 84074

Contact Person/Engineer: Richard Jirik / Parsons

Well Location *Note any changes*

~~XXXXXXXXXX~~ from the ~~XX~~ corner of section ~~XX~~ Township 3S, Range ~~XX~~ SL B&M
N624 E850 SW 30 4W

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #) C-48

Drillers Activity Start Date: July 27, 2005 Completion Date: September 23, 2005

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Monitor Well

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	380	9	Percussion Hammer	Air

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordor, fracturing, minerology, texture, degree of weathering, hardness, water quality, etc.)
0	349						X	X	X					
349	380	X					X	X	X					

Static Water Level

Date August 2, 2005 Water Level 349 feet Flowing? ☐ Yes ☒ No
Method of Water Level Measurement WLI If Flowing, Capped Pressure N/A PSI
Point to Which Water Level Measurement was Referenced Ground Level Elevation N/A
Height of Water Level reference point above ground surface N/A feet Temperature N/A degrees ☐ C ☐ F

Construction Information

DEPTH (feet) FROM	DEPTH (feet) TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	DEPTH (feet) TO	☒SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	349	4" sch. 40 PVC	40	4	349	379	.010	4	Factory Sl

Well Head Configuration: Flush Mount — Access Port Provided? ☒Yes ☐No

Casing Joint Type: Flush Thread — Perforator Used: N/A

Was a Surface Seal Installed? ☒Yes ☐No — Depth of Surface Seal: 345 feet — Drive Shoe? ☒Yes ☐No

Surface Seal Material Placement Method: Tremie Bentonite Pellets and Bentonite Grout

Was a temporary surface casing used? ☒Yes ☐No If yes, depth of casing: 380 feet diameter: 9 inches

DEPTH (feet) FROM	DEPTH (feet) TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	341	Bentonite Grout	71 Bags	50 lbs each
341	345	Bentonite Pellets	2 Buckets	50 lbs each
345	380	16 - 40 Silica Sand	27 Bags	50 lbs each

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
	N/A					

Pump (Permanent)

Pump Description: N/A — Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? ☐Yes ☐No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name LAYNE CHRISTENSEN COMPANY (Person, Firm, or Corporation - Print or Type) — License No. 626

Signature _____ (Licensed Well Driller) — Date September 28, 2005

APPENDIX B

7/28/05 Thursday weather: clear 80-90 breezy

6:50 I arrive at site. Kurt called me last night and said he and Richard have decided to relocate to MW-48F as they fear MW-47F deflecting into the soil gas well just 15' away from us.

7:15 Tom Kerns & Jake Smith (Layne Crew) arrive

7:30 Kurt Alloway (Parsons) arrives. He has HP Enviro delivering a new rolloff to our next location at C-48F at 10:00. Kurt and crew head to site to figure out how to set up without impeding traffic & work areas of surrounding buildings

8:15 I finish Daily Quality Control reports and head to MW-48F Tom has moved rig

9:40 Pipe truck & compressor in place

10:25 Rolloff in place. I table as Haz Waste PARSNZOS 209 01

10:40 We do rig inspection. I check PID calibration 103.2 on 100 iso-b

10:50 We have H2S tailgate. Topic: Impacted cuttings & dust

11:04 Begin drilling at surface. Kurt onsite

11:37 @ 20 ft Chris Davis & Jeremy Davis (Layne) onsite Crew goes to get wheelbarrow to move cuttings inside rolloff. I have gotten no elevated PID readings from cyclone exaust or in rolloff.

13:00 @ 60 feet we take a break to field office

13:31 Back at site

13:40 Drilling @ 60 ft

16:20 @ 172 ft the cyclone has become plugged by the mist being added to the cuttings forming a clay on the inside of the cyclone. Crew has beat and prayed with little success. They are looking up steam cleaners to try to unplugged

16:34 Drilling @ 172

16:49 180 ft bgs.

17:05 Crew offsite

17:45 I leave site after checking w w/Richard

7/29/05 Friday weather: partly cloudy 70-90 breeze to NW

6:45 I arrive at Parsons Field office - work on Quality Control Reports

7:30 I head to ~~D-MI~~ C-48F. I check PID calibration (101.2 on 100)

7:40 Crew arrives and fuels & lubes rig. I do rig inspection

7:55 We have H & S tailgate

8:25 Begin drilling at 180 ft bgs

10:14 @ 250' bgs we are out of drill pipe. Layne can't get more onsite till Monday. We cover roll off & move cyclone as Kurt will be moving the bin to the 90 Day yard today at 4:00pm (16:00) with HP Environmental Carl Cole onsite ~~with MI~~ for an update

11:15 I am in field office going over Layne invoices w/ Richard He asks that I call Kurt who is surveying in the access easement to D-15 and the well elevations at D-17, D-18 & D-19. He allows that I could take over the oversite of Ward Engineering Crew who is surveying so Kurt could catch up on drum tracker database.

12:20 Kurt call and is leaving sheep lane gate. I head to D-19

13:05 I arrive at D-19. Meet with surveyors Joe Garza and Brandon Ctiben.

14:10 We pick up thier base station and then head to UID office to reset up base to shoot in C-45

14:30 We head to TEAD Main gate to procure badges and vehicle pass for the crew.

15:10 We head back to UID and access C-45 through OG6 gate

15:20 At C-45 crew shoots in elevation and road way on the way out

15:35 We wait for security at OG6

16:04 We are back at UID office. Richard asks that I wait here while he speaks with the engineer at the Ward office

16:45 Richard calls to say survey is complete. I head to field office

17:33 I leave TEAD W Matthews 7/29/05

[redacted]

August 1, 2005 Monday weather: overcast/raining (~70°)

6:40 I arrive at field office

7:30 Still no sign of crew

7:45 Crew (Tom Kern / Jake Smith) arrive at rig. They fuel & oil rig, hammer and compressor. I do rig inspection and label rolloff as HazWaste PARSNZ0521301

8:20 We have H&S tailgate. Topic: respiratory hazards

8:30 Crew set up cyclone in new rolloff bin and positions new pipe truck. I check PID calibration (104.6 on 100)

8:48 Begin drilling at 250 ft bgs

13:45 @ 367 first free water observed

14:19 380' bgs. Check water level. Rising very slowly

15:05 Carl Cole outside. Bullows 615 lessor is wanting to know when we are leaving and if new C-47 location will block his bay doors Tom, Jake, Carl, and I go try to configure an acceptable location. We must be 50 feet from I610-UPT3004. Carl has made a scaled drawing of the area. Once water level in C-48F is certain USACE will pin down location

16:00 Water still rising so Crew leave for the day I will monitor rise. I return to field office

16:30 Kurt is overseeing Viola unload Developement water from C-45 in baker tank 2. I recheck water level at C-48F. W.L. = 353.8 so we are deep enough for new design (i.e. 25 feet of screen below W.L and 5 ft of screen above) This is a "water table well"

17:05 Back at office for DQC reports

17:47 Offsite

8/1/05

August 2, 2005 Tuesday weather: clear (70-90°) no wind

6:45 I arrive at TEAD and head to 066 to meet Mark Bear (Viola). I have borrowed thiem 500' water level meter. Ours is 300' and water in C-48F is deeper

7:25 Tom and Jake arrive and lift the head off the casing so I can check water level.

7:44 W.L = 353.8 ft bgs. Crew drills casing back down to 379 ft where we will set well

8:05 We have H&S before setting well. Topic: Hearing protection

8:16 I do rig inspection

8:40 Crew begins constructing well using a 4" threaded PVC schedule 40 bottom cap, 3-10 ft sections of 4" schedule 40 .010 slotted screen (PVC), and 350 ft of 4" schedule 40 PVC blank casing. Carl Cole onsight

9:58 We are 100' short on blank casing but it is being delivered very soon.

Once we begin placing sand we will fill the annulus from 379 to 346 ft. The hole annulus volume for a 9" hole and a 4" well is

$$[(.75ft)^2 \times .785 \times 1\,foot] - [(.33ft)^2 \times .785 \times 1\,foot]$$
$$= 0.44\,ft^3 - 0.09\,ft^3 = 0.35\,ft^3/ft$$

.785 is a constant provided by Carl Cole

$33\,ft \times 0.35\,ft^3/ft = 11.55\,ft^3$

Each sand bag is $\sim 0.5\,ft^3$ ∴ it should require 23 bags of sand

10:23 Dave Kyle arrives with additional casing

10:44 Casing in place

10:58 MP Environmental arrives to move rolloff bin to the 90 Day yard. Kurt Alloway onsite

11:50 Crew pumps free water out of the rolloff and into the Baker tank containing C-45 water. Crew also pumps rainwater from the Decon pad sump into the Baker Tank

Aug 2, 2005 Tues (cont)

12:40 Back at C-48f crew begins adding sandpack to the well annulus using 50 lb bags of 16-40 colorado silica sand, by pouring into a funnel at the surface and sounding as they pull up casing trying to always have a few to several ~~feet~~ inches of sand in the casing to prevent hole caving or sand bridging.

13:40 Jeff Hausmann of Violia is in the 90-Day yard so I borrow W.L. meter & take reading. WL = 551.8 which is 2 feet higher than previous reading. I take the meter to C-19 to back check against the readings I took on 7/27/05 with the meter I used this morning. The two are very similar so I can discount meter error. Perhaps the rize is due to slugging the annulus with sand and not having reached equilibrium or exposing more the native soils by pulling 10' casing but in any event the well is too sanded in to raise at all without chancing pulling a joint apart so we will carry on and take a level in the morning and see whats what. I have a 500' meter available at our office that I will pickup tonight

14:27 Crew is pulling the secound 10' section of pipe

14:57 Crew has tagged top of sand at 345.6 having used 27 bags of sand. Crew will now place bentonite seal using Cetco coated ¼" bentonite tablets which are designed to fall through a 150 ft column of water before becoming sticky or swelling

15:06 2 buckets of pellets have brought top of seal to 341.5' bgs seal is above water level so we hydrate with 10 gallon ME Water Well 3 water Crew pulls 10 more feet of pipe (40 feet out of hole)

15:35 Crew moves to 90-Day yard to load trash & unload supplies for grouting.

Aug 2, 2005 Tues (cont)

16:06 Crew offsite. I head to office for DQC reports and FAR reports.

17:35 Reports complete. I am heading to the Klewfelder office to pick up a 500 ft water level meter there.

18:20 I leave Klewfelders and head back to Tooele

18:58 Arrive in Tooele

Matt Hunt 8/2/05

Aug 3, 2005 Wednesday weather: clear 80-90°, no wind

6:30 I arrive at field office & change battery on water level meter.

7:10 Crew arrives + we have H&S and inspect grout plant & pipe truck

7:25 While the test light on the meter work I am unable to get it to function in a bucket of water. I call Violia to use theirs again

8:15 Carl Cole on site. He is able to exact meter by touching poles with a metal object but still won't work in water. Mark Bear calls back and I go to OGG for meter

8:40 Back at well C-48E I get a water level = 351.5' bgs. This is up 0.3 ft since yesterday. This is just 2.5 ft below the top of the screen but little we can do at this point to change. Carl and I agree that we are likely at highest level in some time and seasonally so we should be o.k. Crew begins grouting from 341.5 to surface 341.5 ft x 0.35 ft^3/ft = 119.5 ft^3. Each 50 lb bag of Pure Gold bentonite grout yields 2.2 ft^3 at 30% solids when mix thoroughly with 14 gallon H_2O. 119.5 ft^3 / 2.2 ft^3/bag = 54.3 bags at least to do the job depending on how much is lost to the soil formation

11:10 Crew needs more water. I call Gary Parker. He say Gary Polaski can't be here till noon. Crew waits. 160 feet of pipe still in hole

12:07 Gary arrives at Water Well 3

12:50 Crew back grouting

13:50 Crew has used 62 bags of grout & still has 80 feet of casing in the ground

Richard and the USACE have determined new C-47 hole location based on an engineering

Aug 3 (cont)

Drawing discovered showing the exact location of the building 615 degreaser. He faxes me drawing and I locate and paint hole location on the ground. Don Yea (UID) will meet me this afternoon to O.K. excavation here

14:40 I speak with Don. He will meet me in 15 min at 615

15:05 Crew has completed grouting to surface using 71 bags of grout - 17 more than the calculated volume. They now start mobilizing equipment (except rig which must keep well in suspention) back to 90-Day yard for decon.

15:25 Tom and Jake take off for today. Toms daughter has surgery tomorrow and there is a chance he wont be able to work but he will let me know. Im still waiting for Don Yea

15:45 Don arrives. He knows there to be a water line in the near vacinity to new C-47F location so we go inside building 615 and locate its direction He says if we drill where I have painted we should be good to go.

16:35 I return to field office to do reports and line up concrete cutter for C-47B tomorrow

17:07 I leave site

Matt Lewis 8/3/05

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/28/2005

Site: SWMU 58 - TEAD Arrival Time: 6:50

Team Leader: Richard Jirik Departure Time \Destination: 17:45

Team Members: Matt Ivers, Kurt Albaugh Weather: clear 80-90 breezy

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-48F
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 10:52 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Impacted cuttings

Logbook Book # 2MI Page # 2

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:50 Arrive at field office. Richard has decided to relocate C-47 as it is only 15' from I610-VPB003 and he fears drilling into it. 7:15 Crew arrives 7:30 Kurt & Crew visit C-48 site to plan set up 10:25 Rig, Pipe truck and new rolloff in place (PARSNT052090I) 10:40 Do rig inspection check PID calibration 10:52 Have H&S tailgate 11:04 Begin Drilling 16:49 180 ft bgs 17:05 Crew offsite 17:45 / Leave site

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7 / 29 / 2005

Site: SWMU 58 - TEAD Arrival Time: 6:45

Team Leader: Richard Jirik Departure Time \Destination: 17:33

Team Members: Matt Ivers, Kurt Albaugh Weather: partly cloudy 70-90 breeze to NW

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-48F
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 7:55 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Hand hail safety

Logbook Book # 2MI Page # 3

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:45 Arrive at site 7:30 Head to C-48 7:40 Crew arrives fish in I.D. inspection 7:55 H&S tailgate 8:25 Drilling at 180 10:14 Out of drill pipe at 250' bgs 11:15 Review invoices w/Richard 12:20 Go to D-18 to do survey outside for Kurt 13:05 Meet survey crew at D-19 (Joe Garza / Brandon Ctiber) 14:30 Get crew badged 15:20 Arrive at C-45 & shoot in survey 16:45 Survey Complete 17:33 Leave site

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 8 / 1 / 2005

Site: SWMU 58 - TEAD Arrival Time: 6:40

Team Leader: Richard Jirik Departure Time \Destination: 17:47

Team Members: Matt Ivers, Kurt Albaugh Weather: overcast-some rain -(70-80°)

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-48F
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 8:20 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Respiratory Hazards

Logbook Book # 2MI Page # 4

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:40 Arrive at field office 7:45 Crew arrives Fuel + Lube, Rig, Compressor. Do rig inspection and label new roll off PARSN20521301 8:20 H&S tailgate 8:30 Set up cyclone 8:48 Begin drilling at 250' bgs 13:45 @ 367' hit first free water 14:19 @ 380' stop to check slowly rising water level 15:05 Study C-47 new location w/Carl Cole 16:30 Kurt unloads C-45 Developed water with Violia Recheck water Level 353.8 - Deep enough 17:05 DQC reports 17:47 offsite

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 8/2/2005

Site: SWMU 58 - TEAD Arrival Time: 6:45

Team Leader: Richard Jirik Departure Time \Destination: 18:58

Team Members: Matt Ivers, Kurt Albaugh Weather: clear (70-90°) no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-48F
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 8:05 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Hearing Protection

Logbook Book # 2MI Page # 5+6

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:45 I arrive at OG6, meet Mark Bear for water level meter 7:25 Tom & Jake arrive 7:44 Check water level 353.80 8:05 H&S tailgate 8:16 Rig inspection 8:40 Begin well construction - screen 379 to 349 .010 slot 4" schedule 40 PVC sand 380 to 345.6 16-40 colorado silica 14:57 Sand pack complete - also moved rolloff to 90-Day yard & pumped out raw water from sump & free water from rolloff into baker tank 2 15:06 Bentonite seal 345.6 to 341.5. Hydrate seal 15:35 Clean trash from 90-Day 16:06 Crew offsite 17:35 Finish reports - Head to Kleinfelder for 500 ft Water Level Meter 18:20 Leave Kleinfelder for Tooele 18:58 Arrive in Tooele

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 8 / 3 / 2005

Site: SWMU 58 - TEAD Arrival Time: 6:30

Team Leader: Richard Jirik Departure Time \Destination: 17:07

Team Members: Matt Ivers, Kurt Albaugh Weather: clear 80-90° no wind

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-48F
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 7:10 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Dust hazards and lifting technique

Logbook Book # 2MA Page # 8, 9

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N Current Location: Update DITF?: Y / N

Notes: 6:30 Arrive at field office 7:10 H&S tailgate and equipment inspection 8:40 Water Level at C48F = 351.5 Crew begins grouting 11:10 Call Porter for WW3 water 12:07 Polaski arrives at WW3 12:50 Back to grouting 15:05 Grouted to surface with 71 bags - calculated volume 52 bags 15:25 Tom & Jake offsite 15:45 Meet Dow Yea at 615 to look at new C-47F locations. 16:35 To field office for reports 17:07 Offsite

Attachment 1-2

HEALTH AND SAFETY BRIEFING

Date: 7 / 28 / 05 C-48F Time: 7:10

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Silt & DUST emminating from the cyclone
2. is coming from a potential source area.
3. We will make every effort to controll DUST
4. (plastic sheeting, fabric cyclone sock, mister)
5. but some will likely escape. Use a DUST mask
6. if there is a need. Increase water to mister
7. if nessisary. Stand upwind when sampling
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING

Date: 7/29/05 C-48F Time: 7:55

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. A hardhat is only effective when you are
2. standing upright. Always stay on your feet around
3. the drill mast. If it is necessary to assume
4. the lying down position move out of the exclusion
5. zone where there are fewer hazards from
6. objects falling from the sky
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING

Date: 8 / 1 / 05 C-48F Time: 8:20

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Dust from the cemented soils and the
2. adjacent sand blasting booth ~~are~~ consists
3. of PM10 – 5 to 10 micron size particles that
4. once inhaled are unable to escape your lungs
5. Wear a mask (I can provide one) when
6. working in the dust. Smoking increases the
7. hazard many times over
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING

Date: 8 / 2 / 05 C-48F Time: 8:05

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. The adjacent sand blasting booth is extreemly
2. loud high pitched noise. It is definately the
3. type of noise that can cause permenent
4. hearing loss with extended exposure. Wear
5. ear protection always when sand blasting
6. is occurring.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING

C-48F

Date: 8 / 3 / 05 Time: 7:10

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Dust controll and heavy lifting are the
2. issues at hand when well grouting. Wear
3. a mask when mixing the fine bentonite powder
4. Lift bags close to body with legs not back bending
5. Be certain of good footing when pulling pipe
6. twards pipe truck
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

Layne Christensen Company Job Site Safety Audit C-48F

Date 7/27/05	Site: TEAD Phase II RFI @ SWMU 58	Client: USACE

Rig/Crew: Tom Kern / Jake Smith

Observers: Matt Ivers

Crew Safety/PPE	YES	NO	N/A		YES	NO	N/A
Hard Hat	☑	☐	☐	Safety Glasses	☑	☐	☐
Lifting Belt	☐	☑	☐	Training Certificates	☐	☐	☑
Gloves	☑	☐	☐	Hearing Protection	☑	☐	☐
Safety Shoes	☑	☐	☐	Proper Clothing	☑	☐	☐
Layne Safety Practice Manual	☐	☐	☑	Dust masks/Level C respirators	☑	☐	☐
DOT physical card, CDL and logbooks present and up to date?	☐	☐	☑	Emergency numbers/HASP present and posted? *	☑	☐	☐

Comments: * Emergency # on back page of the log book

Site Set-up and Safety							
Hole openings covered or tied off?	☐	☐	☑	Timbers and set-up jacks stable?	☑	☐	☐
Anchor guy lines secure, evenly tensioned and flagged?	☐	☐	☑	Mud or circulation pits barricaded or fenced?	☐	☐	☑
Excavation permit (CA) and shoring considerations?	☑	☐	☐	Traveling blocks, widow makers and elevators inspected?	☐	☐	☑
Site clean and organized? Footing?	☑	☐	☐	Bulk fuel stores lined and grounded?	☐	☐	☑
Pipe blocked and sloped from work area?	☑	☐	☐	Correct monitoring equipment present? *	☑	☐	☐
Overhead and underground lines identified?	☑	☐	☐	Chemicals stored away from fuel and protected?	☐	☐	☑
Material Safety Data Sheets present?	☐	☐	☑	Warning signs/Exclusion zone posted?	☑	☐	☐

Comments: * Air monitored with PID at cyclone discharge
Working adjacent to sand blast booth

Rig Safety							
Kill switch operational?	☑	☐	☐	All mast wiring in conduits?	☑	☐	☐
Vehicle pretrip inspection performed and documented?	☐	☐	☑	Seat belts available and used on all equipment?	☐	☐	☑
Fire extinguisher present and charged?	☑	☐	☐	First aid/BBP kit present and stocked?	☑	☐	☐
Danger points color coded?	☐	☐	☑	Controls identified?	☑	☐	☐
Side guardrails on platform rigs?	☐	☐	☑	Ropes and chains in good condition?	☑	☐	☐
Belts and rotating shafts guarded?	☑	☐	☐	All hooks have safety latches?	☑	☐	☐
Cables in good shape, clamps installed properly?	☑	☐	☐	Pressure hoses safety chained at connections?	☑	☐	☐
Good housekeeping in vehicle cabs?	☐	☑	☐	Spill control materials present?	☑	☐	☐

Rig Safety (cont'd.)	YES	NO	N/A		YES	NO	N/A
DOT #53175 and inspection stickers present and up to date?	☐	☐	☑	Bill of lading, HAZMAT CDL and placarding for hazardous materials hauled?	☐	☐	☑
Climbing blocks and body harness installed, available and used?	☑	☐	☐	Heaters and engines vented outdoors and extinguished?	☐	☐	☑

Comments:

Tool and Equipment Safety							
Spinning chains have rope tail? *	☑	☐	☐	Safety cans used for gasoline storage?	☑	☐	☐
Tools and slings in good condition?	☑	☐	☐	All generators grounded?	☑	☐	☐
Compressed gas bottles secure and upright?	☐	☐	☑	GFI used and electrical cords in good condition?	☑	☐	☐
Tag lines used on hoisted pipe and equipment?	☐	☑	☐	Check valve at torch/hose connection and hoses in good condition?	☐	☐	☑

Comments: * Very short tail

Employee Training							
Employees instructed on safe equipment use?	☑	☐	☐	Heat stress breaks followed and documented?	☐	☐	☑
Knowledgeable of chemicals on site? *	☑	☐	☐	First aid/CPR certified?	☑	☐	☐
Documented tailgate safety meeting before start of work?	☑	☐	☐	Applicable training up to date including respirator fit test, MSHA and/or OSHA.	☑	☐	☐

Comments: VOC impacted soils - mainly TCE

Confined Space Work							
Confined Space Entry Permit complete?	☐	☐	☑	Gas monitor on site?	☐	☐	☑
Ventilation equipment available?	☐	☐	☑	Body harness and safety line present?	☑	☐	☐

Pump Jobs/Well Rehabilitation/Filters and Vaults							
Lockout/Tagout on electrical controls?	☐	☐	☑	Chemical storage area secure?	☐	☐	☑
PPE for chemicals available?	☑	☐	☐	Water available for flushing chemicals?	☑	☐	☐
Cable spool and in safe position?	☑	☐	☐	Explosives stored and secured properly?	☐	☐	☑
Test pump engine drive shaft guarded?	☑	☐	☐				

Comments: H & S tailgate topics 7/27/05 Dangerous adjacent buildings 8/2/05 Hearing Protection
7/28/05 Impacted cuttings + Dust 8/3/05 Dust & lifting
7/29/05 PPE - Hardhat Safety
8/1/05 Respiratory Hazards

Auditor's Signature 7/27/05 MI 7/28/05 MI 7/29/05 / 8/1/05 MI / 8/2/05 MI
8/3/05 MI

Driller's Signature

Helper's Signature

EQUIPMENT CALIBRATION LOG

Tooele Army Depot

Phase II RFI @ SWMU 58

Eqpt. Type PID	Serial No.	Date	Calibration Time	Calibration Gas	Calibration Gas Lot No.	Calibrated By:	Comments
MWI RAE2000	9296	6/29/05	9:25	100 ppm isobutelyne	82617-117	Matt Ivers	Monitoring well D-17
"	"	7/6/05	7:50	"	"	"	" D-18
"	"	7/14/05	8:10	"	"	"	" D-19
"	"	7/20/05	14:40	"	"	"	" C-45
"	"	7/28/05	10:40	"	"	"	" C-48f
"	"	7/29/05	7:30	"	"	"	" "
"	"	8/1/05	8:30	"	"	"	" "
"	"	8/5/05	8:05	"	"	"	" C-47f
"	"	8/8/05	8:25	"	"	"	" "
"	"	8/9/05	8:38	"	"	"	" "
"	"	9/20/05	8:50	"	"	"	" C-49

APPENDIX C

DRILLING LOG

DIVISION: Sacramento

INSTALLATION: Tooele Army Depot

SHEET 1 OF 10 SHEETS

1. PROJECT: TEAD Phase II RFI @ SWMU 58
2. LOCATION (Coordinates or Station): 7360431.77 N 1404989.18 E
3. DRILLING AGENCY: Layne Geoconstruction
4. HOLE NO. (As shown on drawing title and file number): C-48F
5. NAME OF DRILLER: Tom Kerw / Jake Smith
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 380+'
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 380'
10. SIZE AND TYPE OF BIT: 9" OD 6" ID
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL: Drill Systems AP1000 Becker Hammer
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 78; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/28/05; COMPLETED 8/3/05
17. ELEVATION ~~TOP OF HOLE~~: 4824.03 (GROUND) 4823.67 (TOC)
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Matt Imm

a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
11:04					1	Because the Becker Hammer allows a maximum clast size of about 6" to get to surface, percentages of cobble or boulders are speculative
	2		Well graded gravel with clay (GW) 80% cobble & gravel, subrounded fine to coarse, 20% med to coarse sand, 10 to fines, moderate plasticity very dark grayish brown 2.5Y 3/2, moist, strong reaction to HCL	PID = 2.8		
11:13						— plugged
11:16	4					
	6				2	While clasts range from angular to subrounded most angular clasts are likely due to the drilling process and as long as some water worn clasts are observed bedrock will not be indicated
	8			1.7		
11:20						1.3 MIN/FT
11:26	10				3	Unless otherwise indicated clasts consist mainly of tan to gray quartzite and/or dark to gray limestone or dolomite with trace amounts of yellow-brown sandstone red, green & violet extrusive volcanics and a white silicate mineral
	12		- Well graded sand w/gravel (SW) 70% sand, med to coarse, angular to subrounded 30% gravel to 5" subrounded light olive brown 2.5Y 5/2 moist, strong reaction to HCL	0.5		
	14					
	16				4	
	18			0.4		
11:37						1.1 MIN/FT
11:58	20		- gravel & sand 50-50% (SP-GW)		5	— crew to lay down yard
	22			0.2		
	24					
	26				6	
	28			0.2		
12:08	30		- increasing clay content			1.0 MIN/FT

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
12:11	32		Well graded gravel w/clay (GW) as above at 0-11'	0.5 (PID)	7		
	34						
	36		Well graded gravel w/sand (GW) 70% cobble + gravel, A to SR, f to c 25% sand, med to coarse Brown 10YR 4/3, moist strong reaction to HCl trace - 5% fines	0.0	8		
	38						
12:18	40						
12:39				0.2	9	0.7 min/ft	shovel out corner of rolloff
	42						
	44						
	46			0.0	10		
	48						
12:48	50						
12:51					11	0.9 min/ft	
	52			0.0			
	54						
	56			0.2	12		
	58						
13:00	60						
13:40					13	0.9 min/ft	
	62			0.2			
	64						
	66			0.4	14		
	68						
13:45	70					0.5 min/ft	

PROJECT Phase II RFI @ SWMU 58 HOLE NO C-48F

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
13:58					15		Fit wheel barrow tire
	72		Well graded gravel w/sand (GW) 60-80% gravel, fine to coarse angular to subround, 15-35% sand med to coarse 5% silt or clay non plastic, non cohesive olive brown 2.5Y4/3 moist, strong reaction to HCL	0.7			
	74						
					16		
	76			1.1			
	78						
14:04	80				17	0.6 min/ft	
14:09				1.6			
	82						
			- Lean Clay (CL) high plasticity, yellowish brown 10YR5/6, moist weak reaction to HCL				
	84				18		
	86			2.2			
			- about 10% coarse gravel + cobble				
	88						
14:13	90				19	0.4 min/ft	
14:17				0.4			
	92		- gravel increases to 40% color of clay changes to pale yellow 2.5Y7/4				
	94		Well graded gravel w/sand (GW) as above @ 90'		20		
	96			0.0			
	98						
14:27	100				21	1.0 min/ft	
14:30				0.5			
	102						
	104		- Lean Clay w/gravel (CL) high plasticity, ~30% gravel fine to coarse, light olive brown 2.5Y5/4 moist, strong HCL reaction		22		
	106			0.9			
	108		(GW) as above				
14:43	110					1.3 min/ft	

PROJECT Phase II RFI @ SWMU 58 | HOLE NO C-48F

PROJECT: Phase II RFI @ SWMU 58 | HOLE NO. C-48F | SIGNATURE OF INSPECTOR | DATE 7/28/05 | PAGE 4 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
14:46							
			- Cobbles to 7"		23		
	112			0.4			
	114						
			- Silt increases		24		
	116			0.7			
	118						
14:56	120		- Silt decreases				
15:00					25	1.0 min/ft	
	122			2.3			
	124		- Clayey Silt (ML) moderate plasticity, brown 7.5YR 5/4 moist, weak HCL reaction		26		
	126			2.6			
	128		- well graded gravel w/sand (GW), 80% cobble + gravel 15%, med to coarse sand 5% fines, brown 7.5YR 4/2 moist, strong HCL reaction				
15:08	130				27	0.8 min/ft	
15:11			Lean Clay to Silty Clay with gravel (CL) high plasticity, reddish brown 5YR 5/3 to pale brown 10YR 6/3, 0-40% gravel and cobble to 6", angular to subround, fine to coarse moist, strong HCL reaction	3.1			
	132						
	134				28		
	136			1.5			
	138						
15:20	140						
15:23					29	0.9 min/ft	
	142		- well graded gravel (GW) w/clay 70% cobble + gravel 20% sand 10% clay weakly cohesive	0.4			
	144						
			- no clay		30		
	146			0.2			
	148						
15:31	150					0.8 min/ft	

PROJECT: Phase II RFI @ SWMU 58 | HOLE NO C-48F

PROJECT: Phase II RFI @ 58 | HOLE NO.: C-48F | SIGNATURE OF INSPECTOR: [signature] | DATE: | PAGE: 5 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
15:43					31		
	152		Well graded gravel w/sand (GW) 80-90% gravel, cobble + boulders, 20-10% sand on S.H, fine grain, Dry, grey 5Y 6/1 Strong HCL reaction	0.2			
	154						
					32		
	156			0.0			
	158						
15:54							
15:58	160				33	1.1 min/ft	
	162		- Silty Clay w/gravel (CL) high plasticity, pale brown 10YR 6/3, moist, moderate reaction to HCL	0.0			
	164						
					34		
	166			0.0			
	168		- (GW) as above				
16:07	170		- many (most) angular fragments indicating boulders and/or large cobbles, largely grey quartzite		35	0.9 min/ft	
16:14				0.0			
16:20	172						- cyclone hose plugs at cyclone
16:34							
	174						
					36		
	176			0.2			
	178						
16:49	180						
7/29/05					37	2.1 min/ft	
8:25	182			0.0			
	184						
					38		
	186		- clay increases to ~10% cuttings become moist and brown and more sandy (~20%)	0.2			
	188						
8:44	190						

PROJECT: Phase II RFI | HOLE NO.: C-48F | SIGNATURE OF INSPECTOR: [signature] | DATE: 7/29/05 | PAGE: 6 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
8:47	192				39		
				0.4			
	194		- Lean Clay				
			- Sandy Clay w/gravel		40		
	196			1.2			
			- Well Graded Gravel (GW) strongly cemented				
	198						
8:56	200						
9:00					41	0.9 min/ft	
	202		Well graded gravel with sand (GW)	1.9			
	204						
					42		
	206			0.4			
	208						
9:10	210						
9:13					43	1.0 min/ft	
	212			0.5			
	214						
					44		
	216			0.1			
	218						
9:21	220						
9:34					45	0.8 min/ft	
	222			0.0			
	224						
					46		
	226			1.0			
	228						
9:34	230					1.0 min/ft	

PROJECT: TEAD Phase II RFT @ SWMU 58 | HOLE NO: C-48F

PROJECT: TEAD Phase II RFI | HOLE NO.: C-48F | SIGNATURE OF INSPECTOR: [signature] | DATE: 7/29/05 | PAGE: 7 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
9:37	232		'Lean Clay with gravel (CL) high plasticity ~20% gravel, fine to coarse to cobble, subrounded Reddish brown 5YR5/4 changing to pinkish gray at base 5YR6/2, moist, strong HCL reaction - silty at base also	0.3	47		
	234						
	236			0.0	48		
	238						
9:45	240		- Well Graded Gravel with sand (GW) 70% cobble, boulder, gravel 25% Sand 5% fines clasts are angular to subrounded, fine to coarse sand is medium to coarse, Brown 10YR4/3 moist Reacts strongly to HCL	0.4	49	0.8 min/ft	
10:02	242						
	244						
	246			0.5	50		
	248						
10:14	250						
8/1/05					51	1.2 min/ft	
8:48	252			0.6			
	254		- very dry and hard				
	256			1.4	52		
	258						
9:03	260						
9:16					53	1.5 min/ft	
	262		- cutting are moist to wet above both cement layers	0.5			
	264						
	266			0.3	54		
	268						
9:33	270					1.7 min/ft	

PROJECT: TEAD Phase II RFI | HOLE NO.: C-48F | SIGNATURE OF INSPECTOR: Matt Lauck | DATE: 8/1/05 | PAGE: 8 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
9:39	272			1.1	55		
	274		Well Graded Gravel with sand, 60-80% boulders, cobbles and gravel, 20-40% sand. Clast of gravel are angular to subrounded fine to coarse grain sand is fine to med grain light olive brown 2.5Y 5/3 moist to very moist, strong reaction to HCL occasional trace of clay, occasionally strongly cemented				
	276			0.7	56		
	278						
9:59	280					2.0 ft/min	
10:03				0.9	57		
	282						
	284						
	286			0.5	58		
10:14							
10:18	288					cyclone plugged	
	290			0.4	59	1.3 ft/min	
10:20							
10:23	292						
	294						
	296			0.2	60A		
	298						
					60B		
10:35	300		- Lean Clay to Fat Clay with fine gravel (CL-CH) High plasticity Very Pale Brown 10YR 8/3 to yellowish brown at base 10YR 5/8 (Fat Clay) Moist, strong HCL reaction		61	1.2 ft/min	
10:38	302			1.1			
	304						
	306		- Silty Gravel w/sand (GM) 60% gravel, f to c, a to sr, 20% sand, f to m 20% silt, non plastic gray 10YR 6/1, Dry Strong HCL reaction	0.7	62		
	308						
10:55	310					1.7 ft/min	

PROJECT: TEAD Phase II RFI @ SWMU 58 | HOLE NO: C-48F

PROJECT: TEAD Phase II RFI | HOLE NO. C-48F | SIGNATURE OF INSPECTOR: [signature] | DATE 8/1/05 | PAGE 9 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
10:59	312		- (GM) as above	0.2	63		
	314						
	316		- Well Graded Gravel with silt and sand (GW-GM) 70% gravel 20% sand 10% silt clasts are fine to coarse subrounded, gray 5YR6/1 Dry, strong reaction to HCl occasionly areas of strongly cemented matrix material	0.4	64		
	318						
11:21	320					2.1 min/ft	
11:44	322			0.0	65		
	324						
	326			0.1	66		
	328						
12:22	330						
12:26	332			0.0	67	3.8 min/ft	
	334						
	336			0.2	68		
	338						
12:56	340					3.0 min/ft	
13:01	342			0.0	69		
	344		- Well Graded gravel w/sand (GW) 70% gravel + cobble, f to c, subrounded to angular, 30% sand fine to med, brown 10YR4/3 Moist, Strong reaction to HCl				
	346				70		
	348						
13:19	350					1.8 min/ft	

PROJECT: TEAD Phase II RFI & SWMU 58 | HOLE NO C-48F

PROJECT: TEAD Phase II RFI | HOLE NO.: C-48F | SIGNATURE OF INSPECTOR: [signature] | DATE: 8/1/05 | PAGE: 10 of 10

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
13:22	352		Well Graded Gravel w/sand (GW) 70-90% Cobble and gravel, fine to coarse, angular to subrounded 5-25% Sand, med to coarse 5-10% clay on occasion brown to multicolored once saturation zone reached, moist to wet strong reaction to HCL	0.2	71		
	354						
	356			1.1	72		
	358						
13:38	360					1.6 min/ft	
				1.3	73		
	362						
	364						
	366			0.0	74		first free water observed @ 367' bgs ▽
	368						
13:56	370					1.8 min/ft	
14:02				0.0	75		
	372						
	374						
	376			0.0	76		
	378						
14:19	380					1.7 min/ft	
				0.0	77		

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

Integrated Subsurface Evaluation

C-48F

COMPANY	: Parsons			OTHER SERVICES:	
WELL	: D-48F			None	
LOCATION/FIELD	: None			None	
COUNTY	: None			None	
STATE	: UT				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 09/09/05	PERMANENT DATUM	: TOPVC		
DEPTH DRILLER	: 380			KB	: None
LOG BOTTOM	: 374.00	LOG MEASURED FROM:	None	DF	: None
LOG TOP	: 0.30	DRL MEASURED FROM:	None	GL	:
CASING DIAMETER	:	LOGGING UNIT	: 202		
CASING TYPE	: PVC	FIELD OFFICE	:		
CASING THICKNESS:	0.2	RECORDED BY	: DM		
BIT SIZE	: 4.5	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9512A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

4486521N
12365991E

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

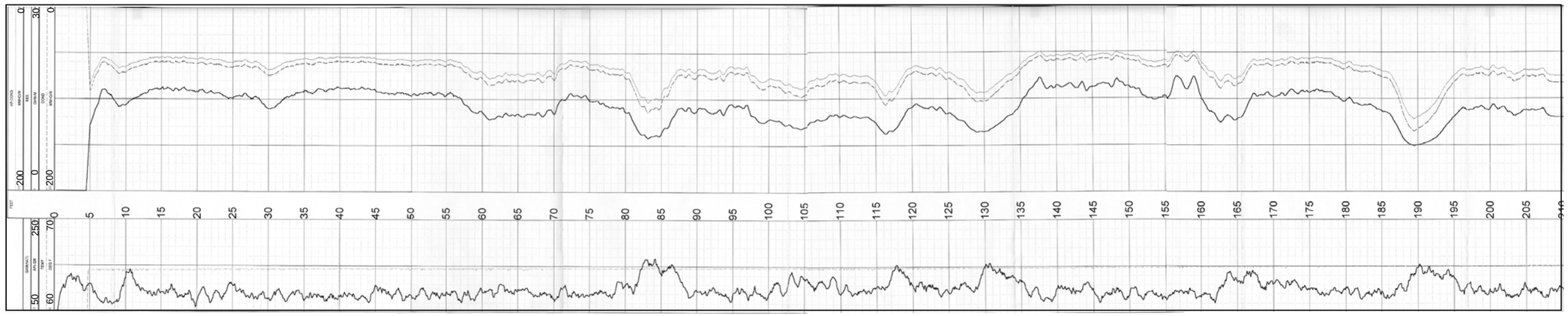
SLC6Q017.ppt

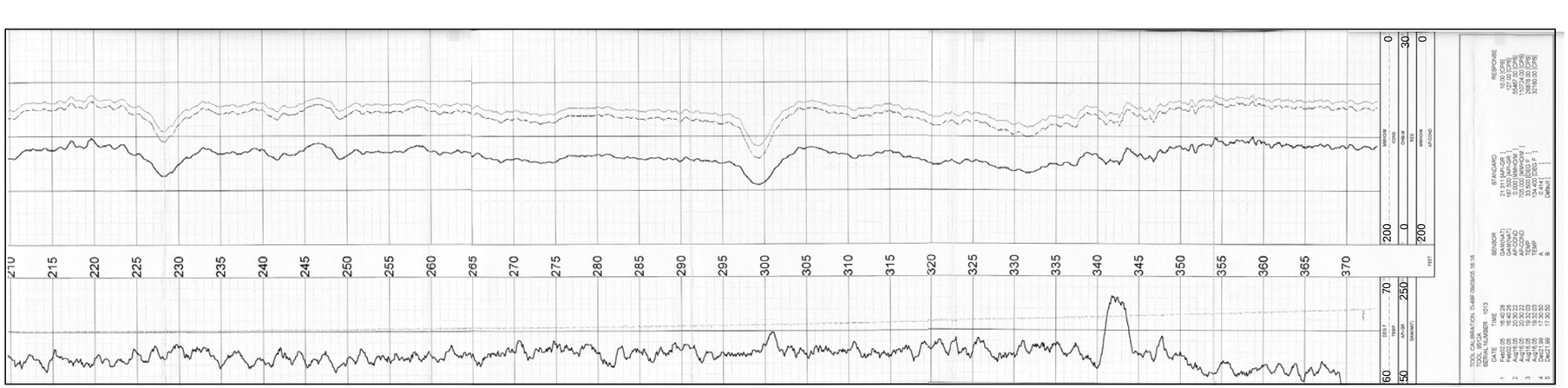
KLEINFELDER
PARSONS
Date:01/18/2006
Project Number 48743.1B

TEAD Phase II RFI

WELL C-48F
NATURAL GAMMA AND
INDUCTION ELECTRICAL LOGS

PLATE
C-2a





SLC5Q276.ppt

KLEINFELDER
PARSONS

Date: 12/09/2005
Project Number 48743.1B

TEAD Phase II RFI

WELL C-48F
NATURAL GAMMA AND INDUCTION LOGS

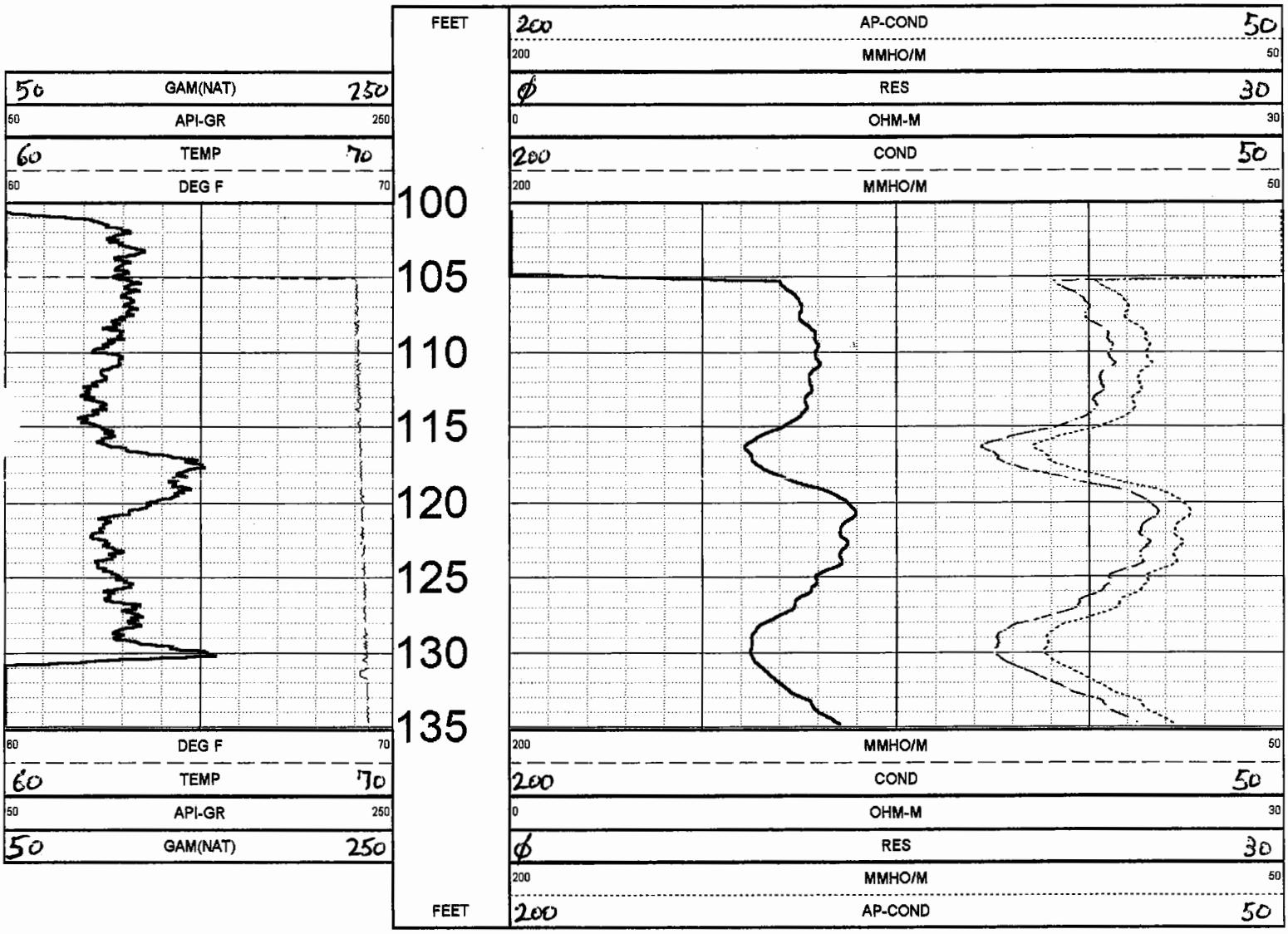
PLATE
C-2b

RAS
Integrated Subsurface Evaluation

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

CD-48F
Repeat

C-48F REPEAT SECTION



TOOL CALIBRATION D-48F-RPTv2 09/09/05 17:21
TOOL 9512A
SERIAL NUMBER 1013

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Feb02,05	17:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CPS]
	Feb02,05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CPS]
2	Aug16,05	20:30:22	AP-COND	0.000 [MMHO/M]	55467.00 [CPS]
	Aug16,05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [CPS]
3	Aug16,05	19:32:03	TEMP	33.500 [DEG F]	26878.00 [CPS]
	Aug16,05	19:32:03	TEMP	134.400 [DEG F]	32180.00 [CPS]
4	Dec21,99	17:30:50	A	0.414 [ ]	
5	Dec21,99	17:30:50	B	Default [ ]	

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
Integrated Subsurface Evaluation email: PedlerRAS@aol.com • www.rasinc.org

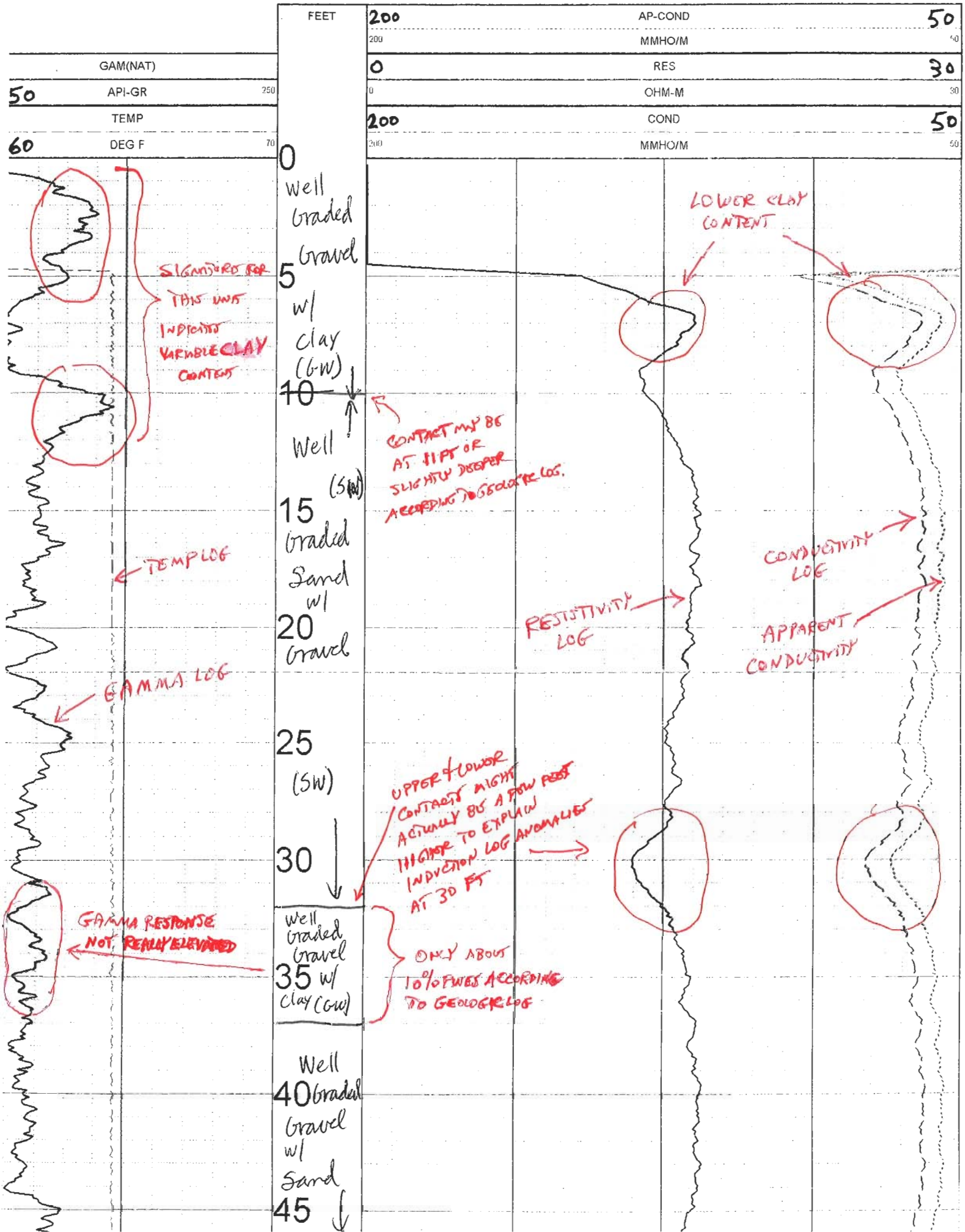
C-48F ~~D-48F~~

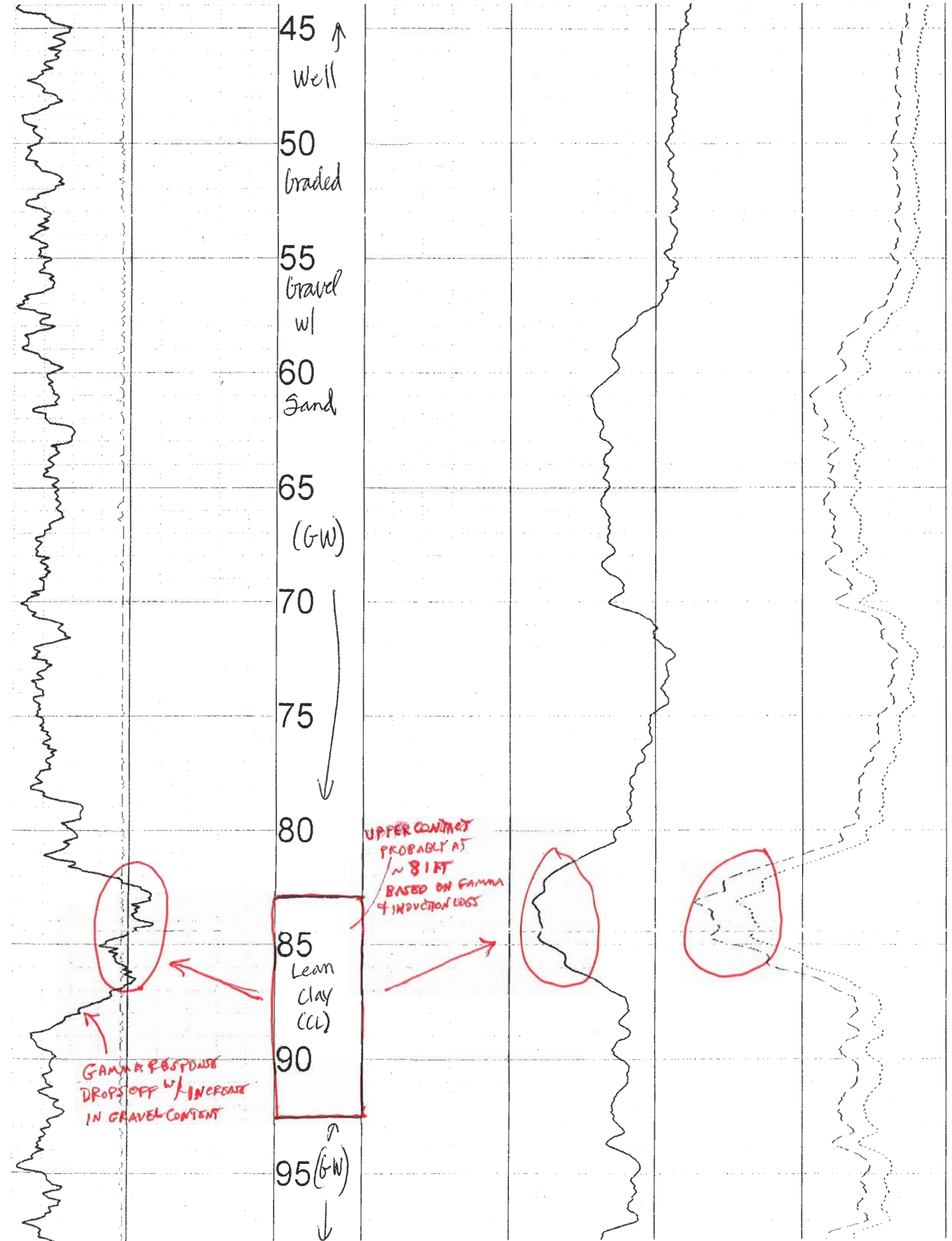
COMPANY	: Parsons			OTHER SERVICES:	
WELL	: ~~D-48F~~ C-48F			None	
LOCATION/FIELD	: None			None	
COUNTY	: None			None	
STATE	: UT				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 09/09/05	PERMANENT DATUM	: TOPVC		
DEPTH DRILLER	: 380			KB	: None
LOG BOTTOM	: 374.00	LOG MEASURED FROM:	None	DF	: None
LOG TOP	: 0.30	DRL MEASURED FROM:	None	GL	:
CASING DIAMETER	:	LOGGING UNIT	: 202		
CASING TYPE	: PVC	FIELD OFFICE	:		
CASING THICKNESS:	0.2	RECORDED BY	: DM		
BIT SIZE	: 4.5	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9512A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

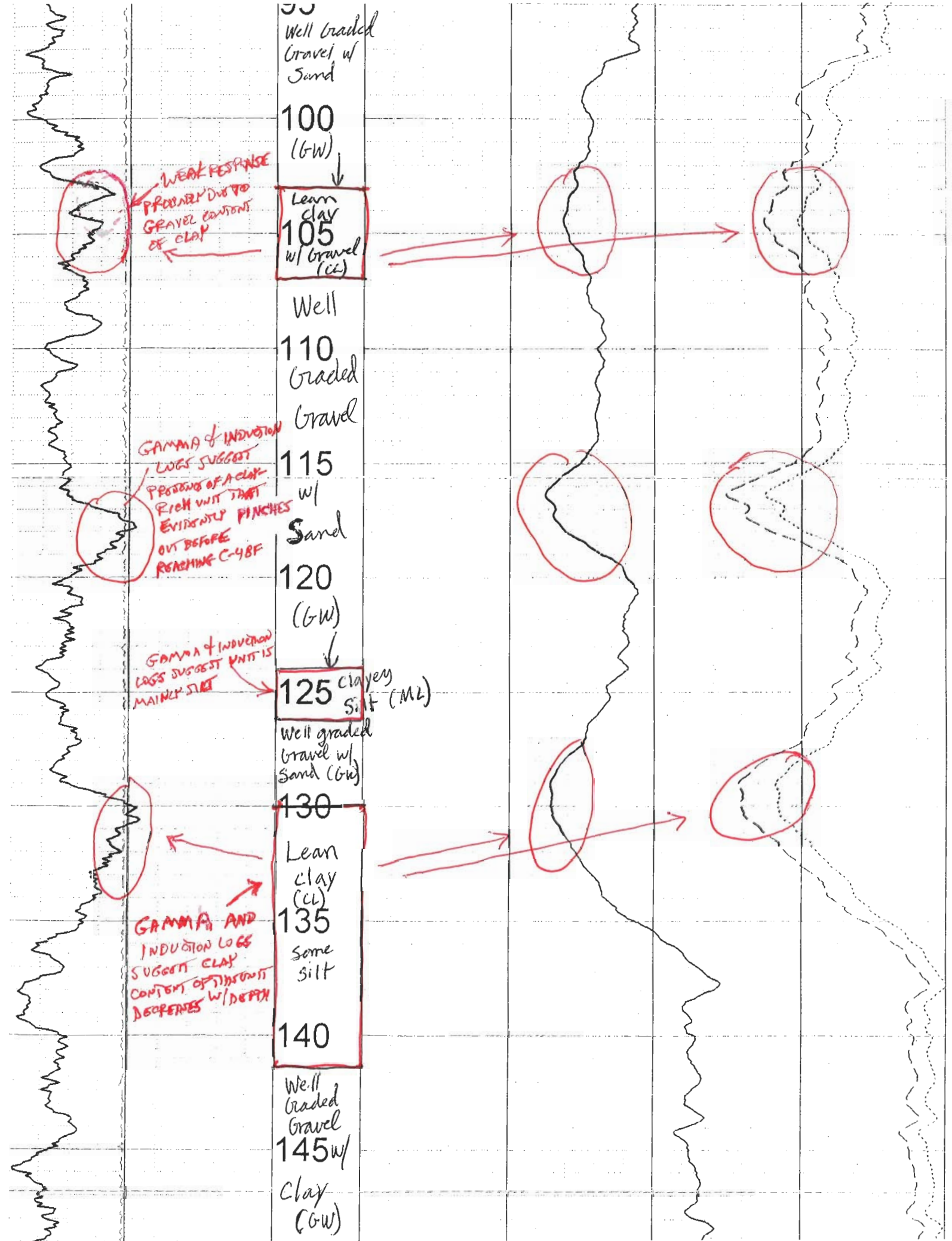
4486521N
12385991E

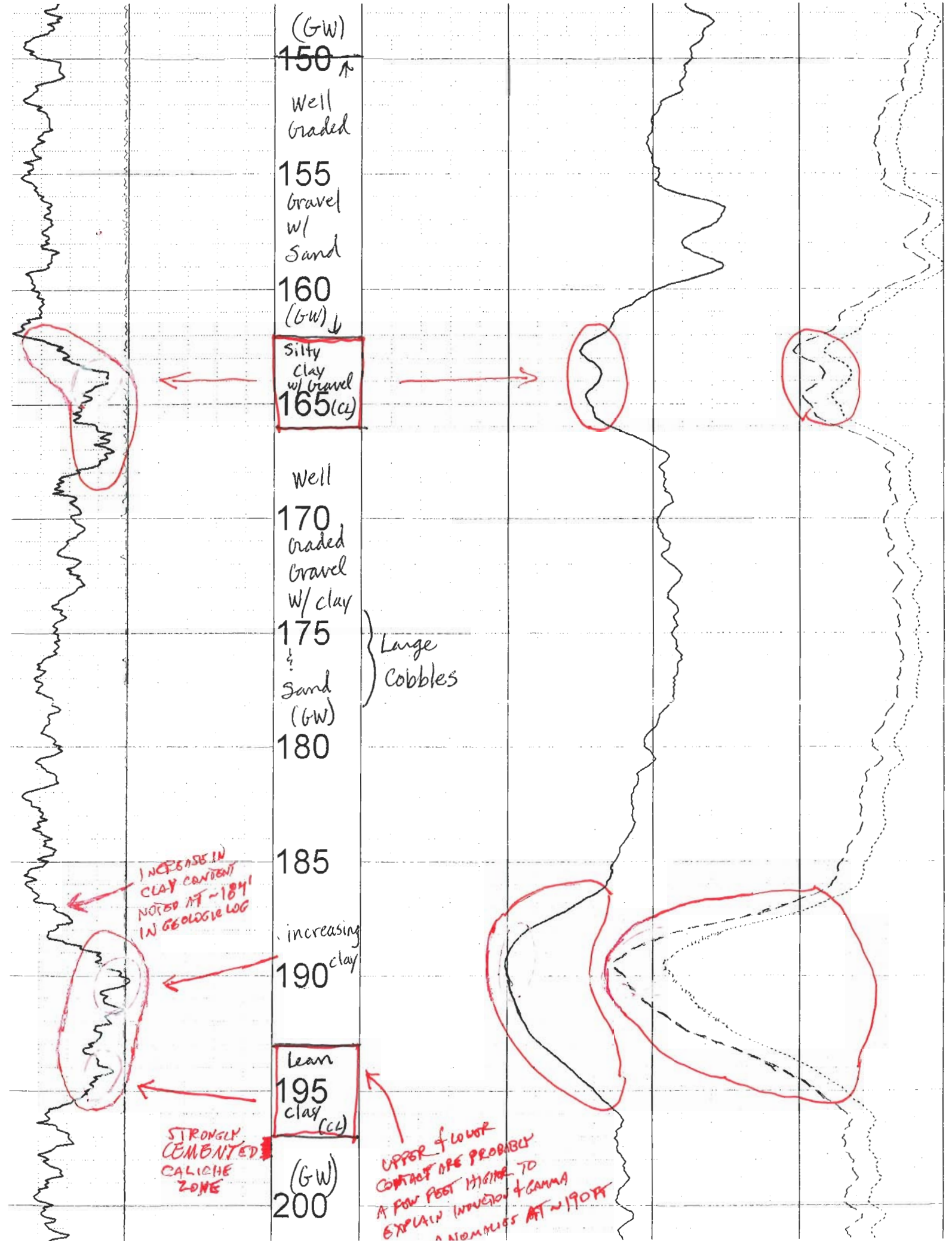
INTERPRETATION OF DOWN HOLE GEOPHYSICAL LOGS

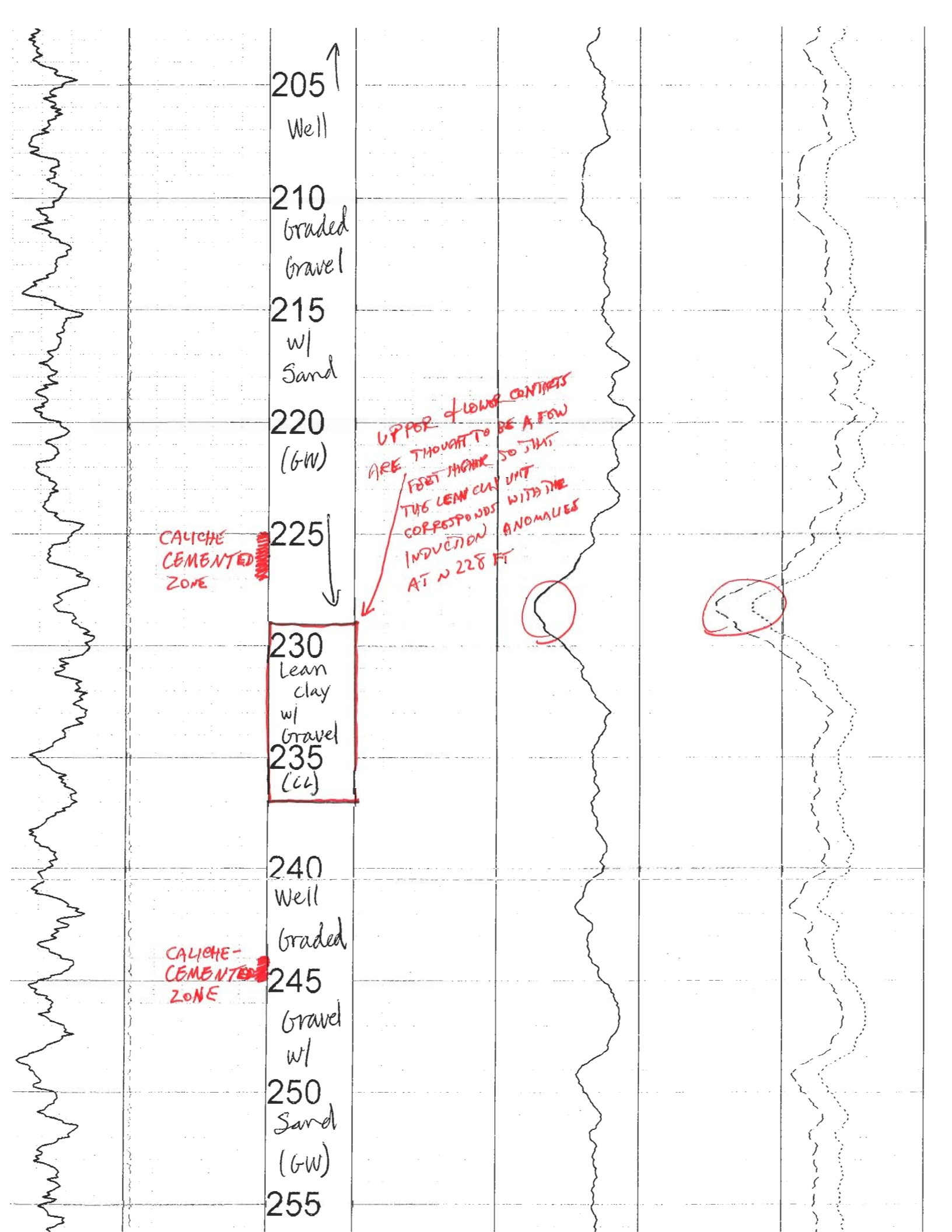
BOREHOLE GEOLOGY FROM GEOLOGIC BORING LOG OF WELL C-48F (BY MAIT/WORS).

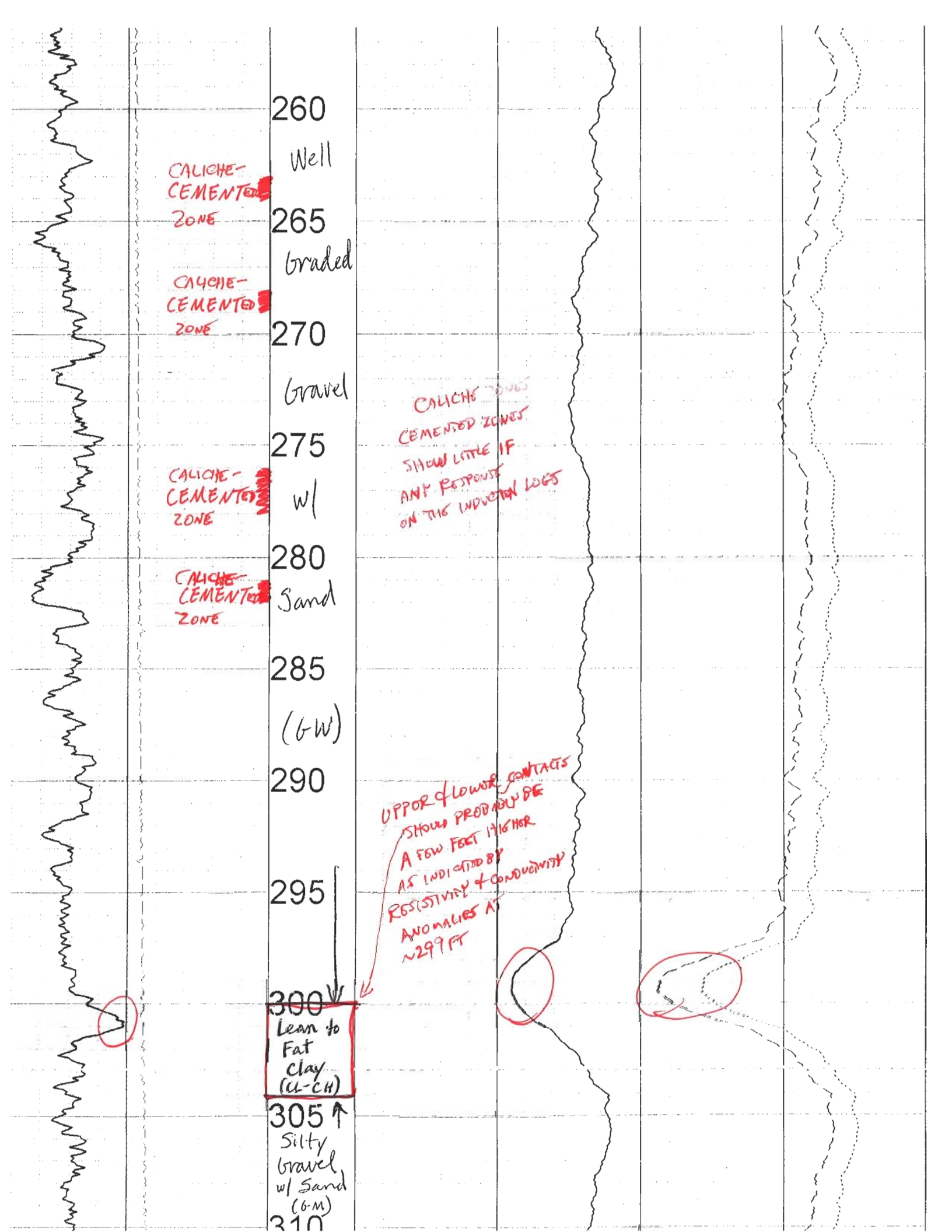

FEET
200 AP-COND 50
200 MMHO/M 50
GAM(NAT)
0 RES 30
50 API-GR 250
0 OHM-M 30
TEMP
200 COND 50
60 DEG F 70
200 MMHO/M 50
0
Well Graded Gravel
5
w/ clay (G-W)
10
Well (SW)
15
Graded Sand w/
20
Gravel
25
(SW)
30
Well Graded Gravel
35 w/ Clay (GW)
Well
40 Graded Gravel w/ Sand
45
SIGNATURE FOR THIS UNIT INDICATES VARIABLE CLAY CONTENT
TEMP LOG
GAMMA LOG
GAMMA RESPONSE NOT REALLY ELEVATED
CONTACT MAY BE AT 11 FT OR SLIGHTLY DEEPER ACCORDING TO GEOLOGIC LOG.
UPPER & LOWER CONTACTS MIGHT ACTUALLY BE A FEW FEET HIGHER TO EXPLAIN INDUCTION LOG ANOMALIES AT 30 FT
ONLY ABOUT 10% FINES ACCORDING TO GEOLOGIC LOG
LOWER CLAY CONTENT
RESISTIVITY LOG
CONDUCTIVITY LOG
APPARENT CONDUCTIVITY

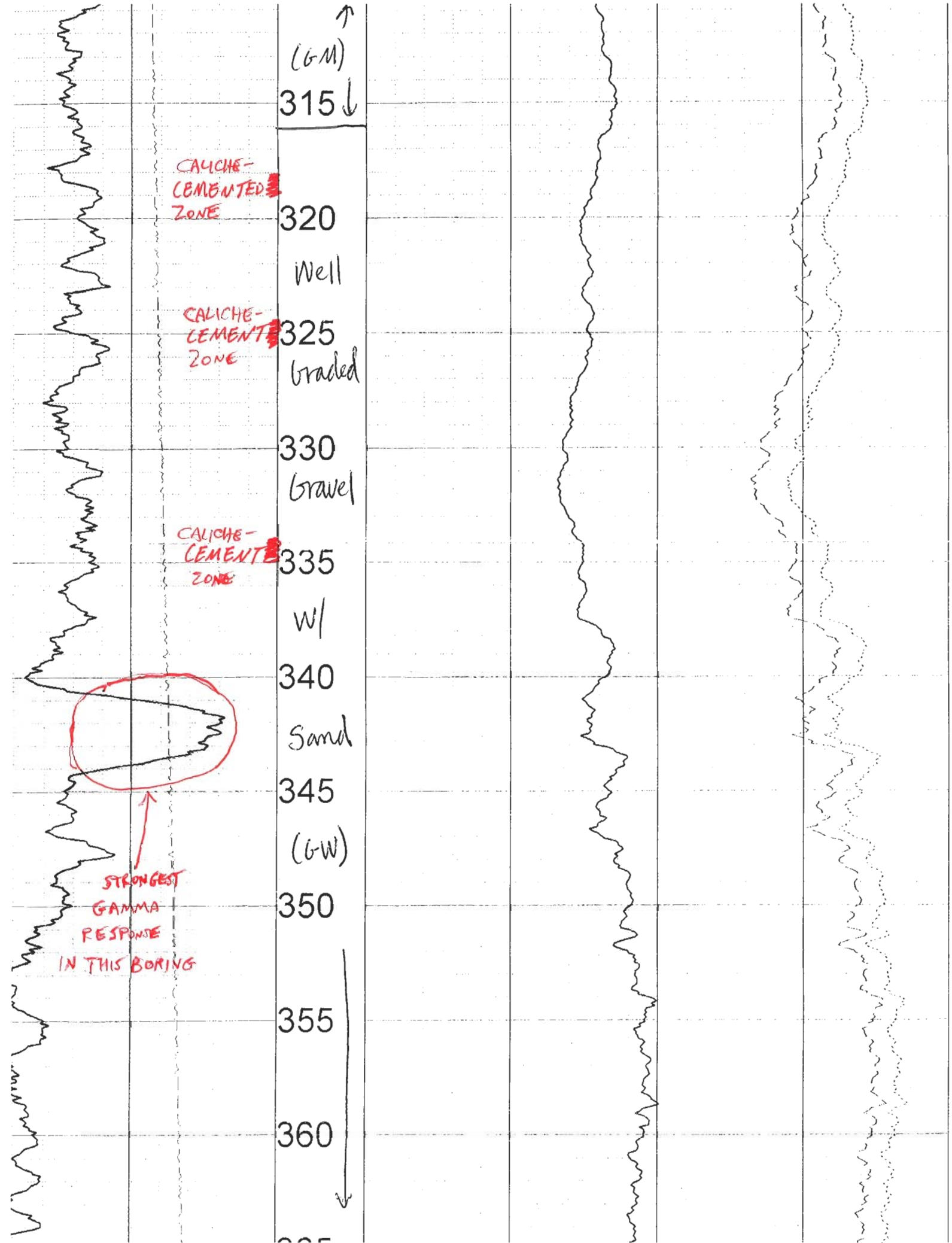

45
Well
50
Graded
55
Gravel
w/
60
Sand
65
(GW)
70
75
80
85
Lean
Clay
(CL)
90
95
(GW)
UPPER CONTACT PROBABLY AT ~81 FT BASED ON GAMMA & INDUCTION LOGS
GAMMA RESPONSE DROPS OFF W/ INCREASE IN GRAVEL CONTENT

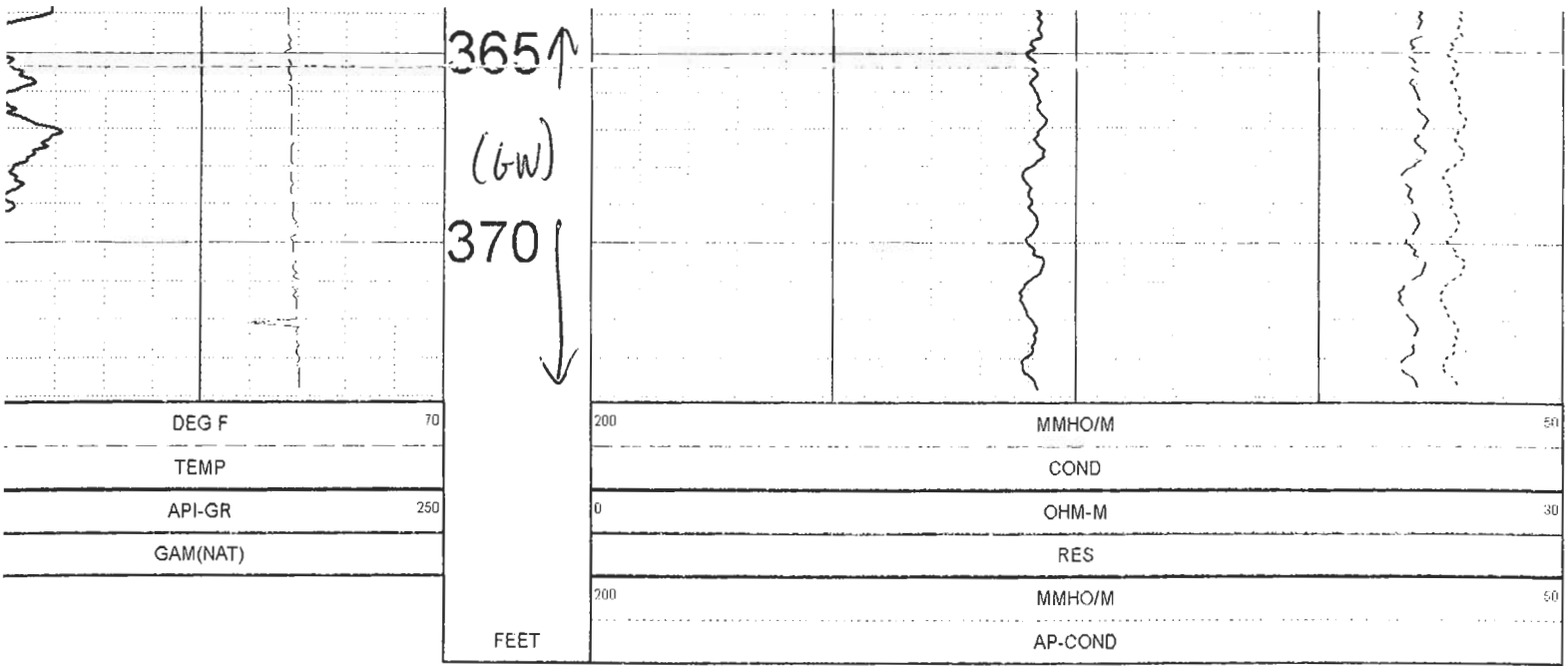

Well Graded Gravel w/ Sand
100
(GW)
Lean clay
105
w/ Gravel (CL)
Well
110
Graded
Gravel
115
w/
Sand
120
(GW)
125
Clayey Silt (ML)
Well graded Gravel w/ Sand (GW)
130
Lean clay (CL)
135
some silt
140
Well Graded Gravel
145
w/ Clay (GW)
WEAK RESPONSE PROBABLY DUE TO GRAVEL CONTENT OF CLAY
GAMMA & INDUCTION LOGS SUGGEST PRESENCE OF A CLAY-RICH UNIT THAT EVIDENTLY PINCHES OUT BEFORE REACHING C-48F
GAMMA & INDUCTION LOGS SUGGEST UNIT IS MAINLY SILT
GAMMA AND INDUCTION LOGS SUGGEST CLAY CONTENT OF UNIT DECREASES W/ DEPTH


(GW)
150
Well Graded
155
Gravel w/ Sand
160
(GW)
Silty clay w/ gravel
165 (CL)
Well
170
Graded Gravel w/ clay
175
Sand (GW)
Large Cobbles
180
185
190
increasing clay
Lean
195
clay (CL)
(GW)
200
INCREASE IN CLAY CONTENT NOTED AT ~184' IN GEOLOGIC LOG
STRONGLY CEMENTED CALICHE ZONE
UPPER & LOWER CONTACT ARE PROBABLY A FEW FEET HIGHER TO EXPLAIN INDUCTION & GAMMA ANOMALIES AT ~190 FT


205
Well
210
Graded
Gravel
215
w/
Sand
220
(GW)
225
230
Lean
clay
w/
Gravel
235
(CL)
240
Well
Graded
245
Gravel
w/
250
Sand
(GW)
255
CALICHE CEMENTED ZONE
CALICHE-CEMENTED ZONE
UPPER & LOWER CONTACTS ARE THOUGHT TO BE A FEW FEET HIGHER SO THAT THE LEAN CLAY UNIT CORRESPONDS WITH THE INDUCTION ANOMALIES AT ~ 228 FT

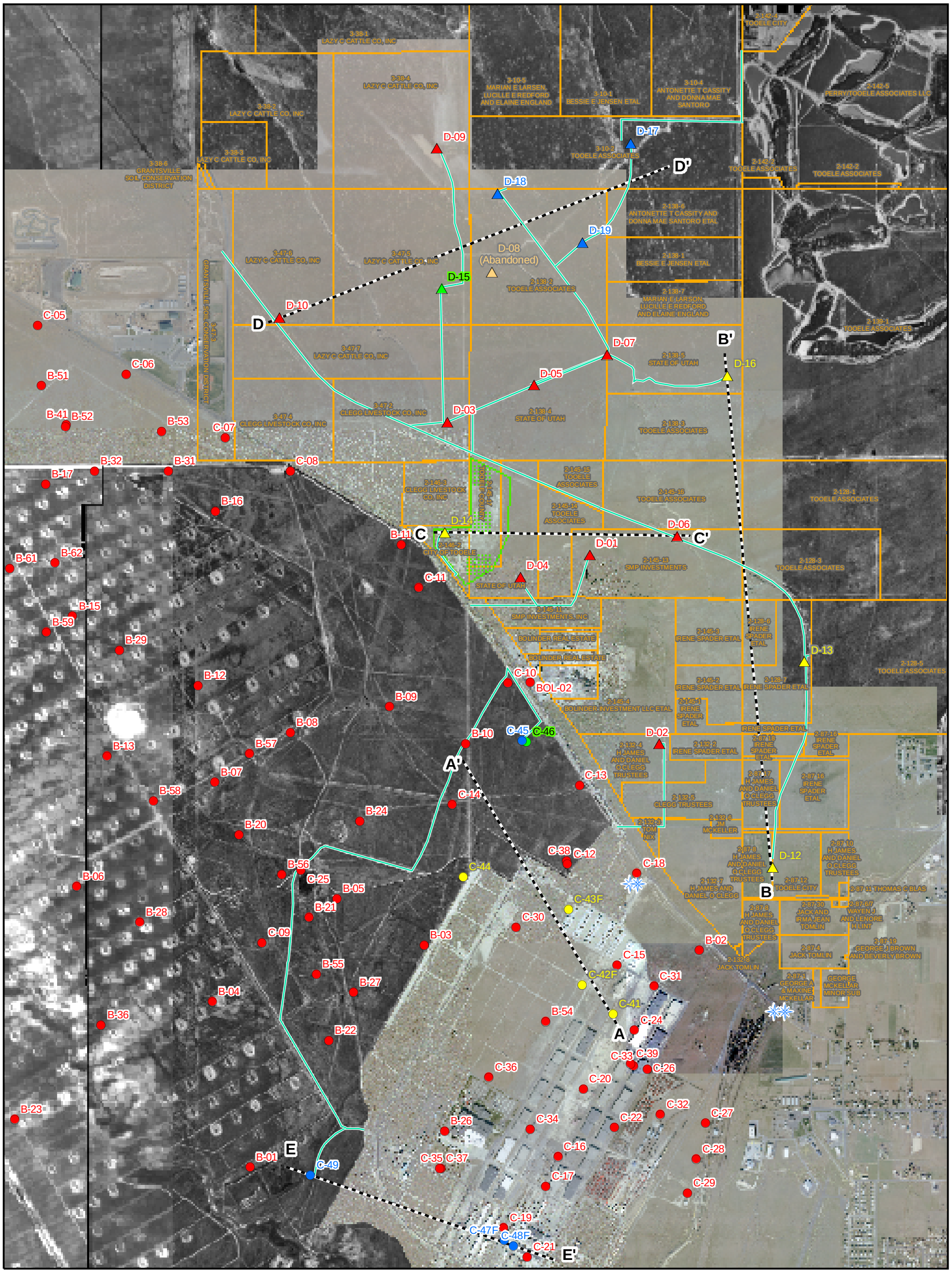

260
Well
CALICHE-CEMENTED ZONE
265
Graded
CALICHE-CEMENTED ZONE
270
Gravel
CALICHE CEMENTED ZONES SHOW LITTLE IF ANY RESPONSE ON THE INDUCTION LOGS
275
CALICHE-CEMENTED ZONE
w/
280
CALICHE-CEMENTED ZONE
Sand
285
(GW)
290
UPPER & LOWER CONTACTS SHOULD PROBABLY BE A FEW FEET HIGHER AS INDICATED BY RESISTIVITY & CONDUCTIVITY ANOMALIES AT ~299 FT
295
300
Lean to Fat Clay (CL-CH)
305
Silty Gravel w/ Sand (G-M)
310


(GM)
315
CALICHE-CEMENTED ZONE
320
Well
CALICHE-CEMENTED ZONE
325
Graded
330
Gravel
CALICHE-CEMENTED ZONE
335
W/
340
Sand
345
(GW)
STRONGEST GAMMA RESPONSE IN THIS BORING
350
355
360



TOOL CALIBRATION D-48F 09/09/05 16:18
TOOL 9512A
SERIAL NUMBER 1013

DATE	TIME	SENSOR	STANDARD	RESPONSE
Feb02,05	16:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CPS]
Feb02,05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CPS]
Aug16,05	20:30:22	AP-COND	0.000 [MMHO/M]	55467.00 [CPS]
Aug16,05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [CPS]
Aug16,05	19:32:03	TEMP	33.500 [DEG F]	26878.00 [CPS]
Aug16,05	19:32:03	TEMP	134.400 [DEG F]	32180.00 [CPS]
Dec21,99	17:30:50	A	0.414 [ ]	
Dec21,99	17:30:50	B	Default [ ]	



LEGEND

Offsite Groundwater Monitoring Wells
- Phase I RFI Well
- Phase I RFI Well - Abandoned
- Phase II RFI - Installed Fall-Winter 2004
- Phase III RFI - Installed Summer 2005
- Proposed Phase II RFI Well

TEAD/UID Groundwater Monitoring Wells
- Existing Well
- Phase II RFI Well - Installed Fall-Winter 2004
- Phase II RFI Well - Installed Summer-Fall 2005
- Proposed Phase II RFI Well

- Survey Benchmark
- Approximate Phase II RFI Well Access Route
- Cross Section Line
- Former Landfill
- Parcel Boundaries / Owners

SWMU 58
PHASE II RFI
TOOELE ARMY DEPOT
TOOELE, UTAH

0 900 1,800
Feet

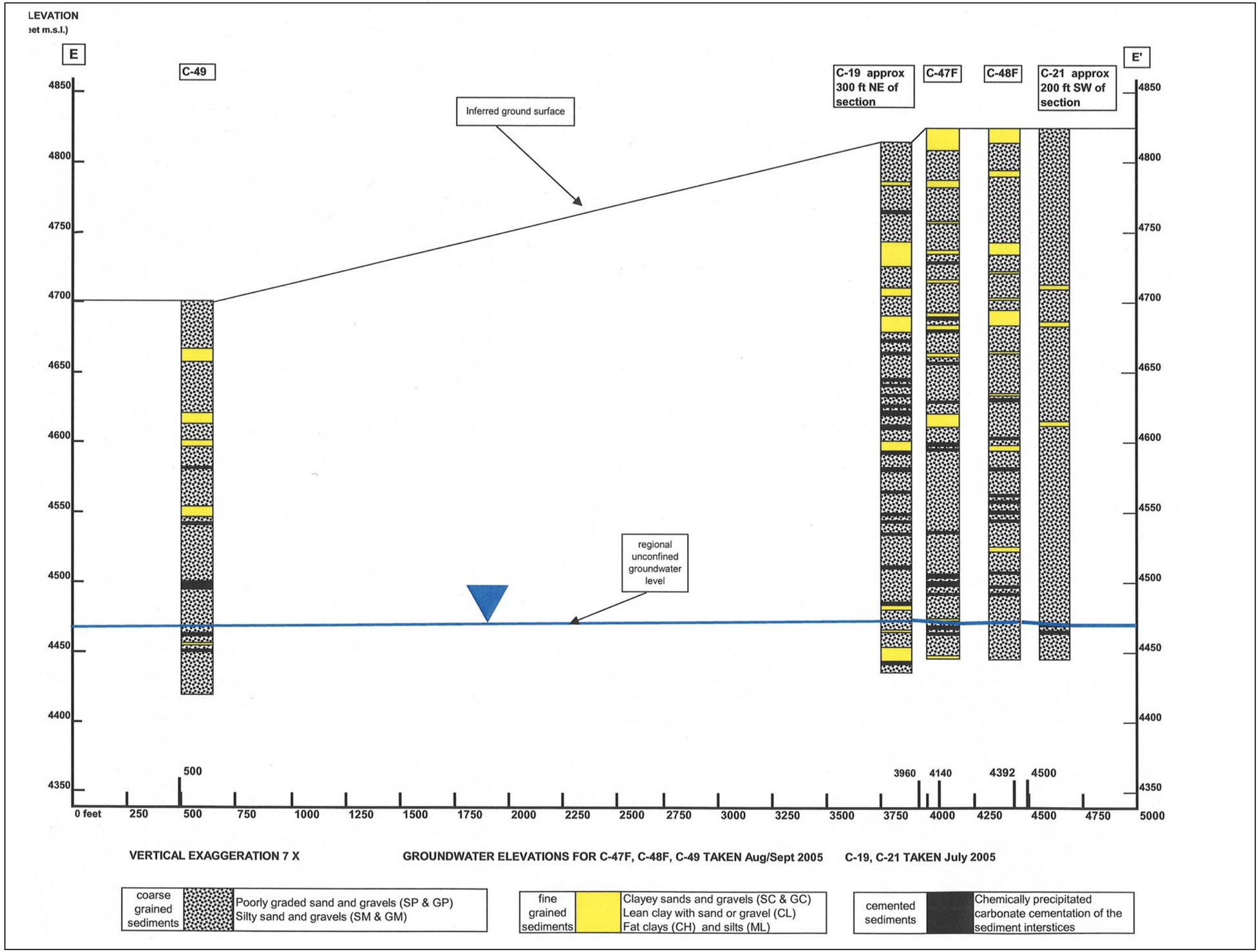
N

PLATE C-3

CROSS SECTION LOCATION DIAGRAM

w:\tooele\maps\well_comp_report_sept2005\cross_section_locations.mxd 01/09/06

PARSONS



SLC6Q008.ppt

KLEINFELDER
PARSONS

Date: 01/09/2006
Project Number 48743.1B

TEAD Phase II RFI @ SWMU 58

HYDROSTRATIGRAPHIC CROSS SECTION E - E'

PLATE

C-4

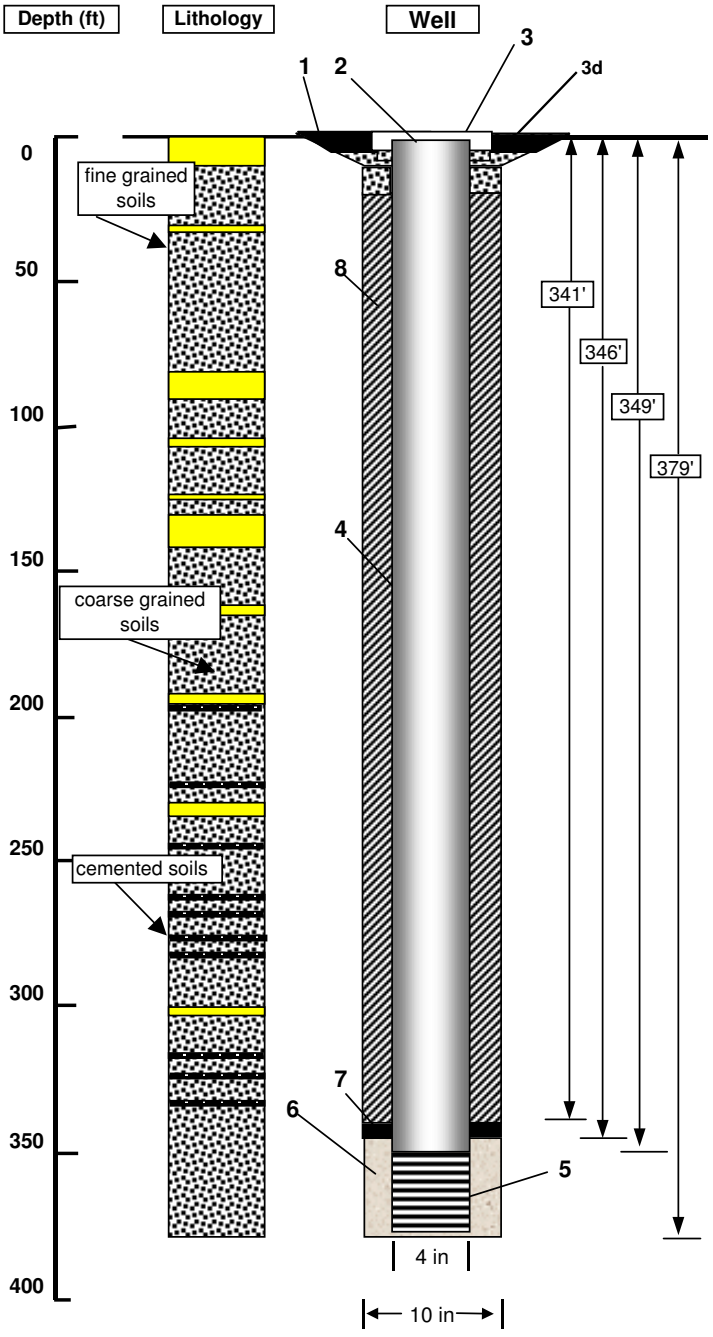
APPENDIX D

CONTRACTOR	WELL NUMBER	PLATE
Kleinfelder/Parsons	**C - 48F**	**D-1**

TEAD Phase II RFI - SWMU 58

MONITORING WELL INSTALLATION DATA RECORD

PROJECT :	**Phase II RFI - SWMU 58**	LOCATION :	**Tooele County, Utah**
DRILLING SUBCONTRACTOR :	**Layne Geoconstruction**	DRILLER:	**Tom Kearn**
DRILLING METHOD AND EQUIPMENT:	**Becker Hammer-Drill Systems AP1000**	HELPERS:	**Jake Smith**
WATER LEVEL : **351.66 ft (TOC) on 8/9/05**	START**: 8/3/05** END: **8/9/05**	GEOLOGIST	**Matt Ivers**



1- Ground elevation at well : 4824.08 feet (brass cap)

2- Measuring point elevation : 4823.67 feet (top of well casing)

3- Surface completion casing :
- a) type / diameter (ID/ OD) : Steel flush mount - 10 inch ID
- b) height above ground : 6 inches - flush with concrete pad
- c) length below ground : 18 inches
- d) type sealant : Portland cement
- e) protective bollards : none

4- Well casing :
- a) type / diameter (ID/ OD) : Schedule 40 PVC / 4 inch
- b) height above ground : top of casing 0.36 feet below ground
- c) length below ground : 379.25 feet
- d) type / quantity of sealant : see # 8
- e) well centralizers : none

5- Well screen :
- a) type / diameter (ID/ OD) : Schedule 40 PVC / 4 inch
- b) slot size : .010 inch
- c) lengths : 3 - 10 foot sections (349 to 379 feet bgs)

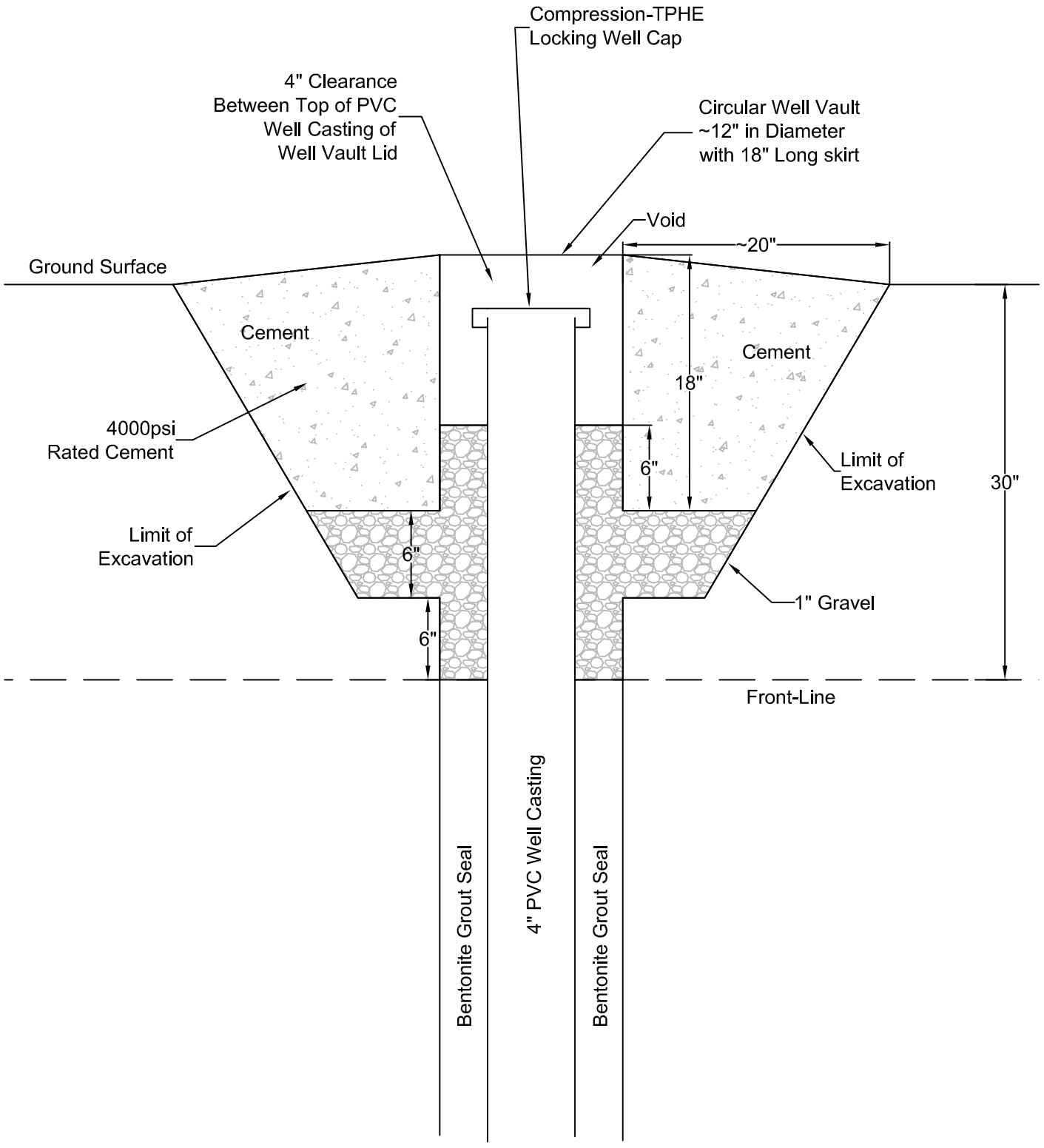
6- Well screen filter pack :
- a) type : #16 / 40 Colorado Silica Sand
- b) quantity used : 27 - 50 lb bags
- c) method of placement : poured from surface
- d) length : 345.6 to 379.25 feet bgs

7- Bentonite seal :
- a) type/quantity : Cetco coated pellets / 2 - 5 gallon buckets
- b) length : 341.5 to 345.6 feet bgs

8- Grout :
- a) grout mix used per batch : 28 gal water to 2 - 50 lb bags bentonite grout
- b) method of placement : pumped from surface
- c) qty of well casing grout : 71 bags (approx 994 gallons)

Well development :
- a) method : bail and swab / pump and back-flush
- b) time : 4 hour 21 minutes / 5 hours 57 minutes

Pumping tests :
- a) drawdown / time : 0.09 feet / 27 minutes
- b) pumping rate : 2.14 to 2.3 gpm



SLC6d016.dwg

KLEINFELDER

Date: 01/16/2006
Project Number 48743.1B

TEAD Phase II RFI @ SWMU 58

FLUSH MOUNT SURFACE COMPLETION
MONITORING WELLS C-47F & C-48F

FIGURE

D-2

SUMMARY OF WELL SURVEY DATA
TEAD Phase II RFI Groundwater Monitoring Wells

Well No.	Elevations (ft above MSL) Measuring Point	Brass Cap	Ground Surface	Top of Well Screen	Bottom of Well Screen	Coordinates for Measuring Point Northing	Coordinates for Measuring Point Easting	Section	Range	Township	PVC Riser Stickup
C-41	**4804.70**	**4802.32**	**4801.67**	**4445.68**	**4425.68**	**7364933.324**	**1406930.413**	30	R 4 W	T 3 S	3.03
C-42F	**4785.09**	**4785.52**	**4785.27**	**4445.27**	**4425.27**	**7365504.752**	**1406335.618**	19	R 4 W	T 3 S	-0.18
C-43F	**4754.87**	**4755.23**	**4755.21**	**4436.21**	**4416.21**	**7366968.52**	**1406061.58**	19	R 4 W	T 3 S	-0.34
C-44	**4722.81**	**4720.44**	**4719.82**	**4439.82**	**4419.82**	**7367591.88**	**1404021.61**	24	R 5 W	T 3 S	2.99
C-45	**4689.99**	**4687.78**	**4687.20**	**4438.20**	**4418.20**	**7370229.15**	**1405164.18**	19	R 4 W	T 3 S	2.79
C-47F	**4824.53**	**4825.08**	**4825.03**	**4476.08**	**4446.08**	**7360556.94**	**1404815.63**	30	R 4 W	T 3 S	-0.50
C-48F	**4823.67**	**4824.08**	**4824.03**	**4475.08**	**4445.08**	**7360431.77**	**1404989.18**	30	R 4 W	T 3 S	-0.36
C-49	**4710.02**	**4707.49**	**4706.90**	**4447.49**	**4427.49**	**7361802.01**	**1401065.35**	25	R 5 W	T 3 S	3.12
D-12	**4803.05**	**4800.56**	**4800.25**	**4455.25**	**4435.25**	**7367777.995**	**1410018.176**	20	R 4 W	T 3 S	2.80
D-13	**4720.05**	**4717.40**	**4717.32**	**4355.32**	**4335.32**	**7371760.079**	**1410629.706**	17	R 4 W	T 3 S	2.73
D-14	**4592.80**	**4590.93**	**4590.39**	**4335.39**	**4315.39**	**7374264.49**	**1403669.88**	13	R 5 W	T 3 S	2.41
D-16	**4580.11**	**4577.75**	**4577.20**	**4346.20**	**4326.20**	**7377300.289**	**1409139.940**	7	R 4 W	T 3 S	2.91
D-17	**4476.25**	**4473.81**	**4473.24**	**4343.24**	**4323.24**	**7381795.49**	**1407265.97**	6	R 4 W	T 3 S	3.01
D-18	**4476.07**	**4473.89**	**4473.20**	**4318.20** **4293.20**	**4298.20** **4268.20**	**7380823.93**	**1404691.14**	7	R 4 W	T 3 S	2.87
D-19	**4497.75**	**4495.75**	**4494.99**	**4346.99**	**4326.99**	**7379876.47**	**1406330.96**	7	R 4 W	T 3 S	2.76

MSL: mean sea level
F for selected well identifiers designates flush-mount surface completion.
Coordinates for measuring point are US State plane 1983, Utah Central 4302, NAD 1983 (CONUS), GEO1D96 (continental US)
All survey data generated by Ward Engineering of Salt Lake City, Utah

Note that well D-18 has two screened intervals.

APPENDIX E

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-48F	Initial Depth to Water: 351.66
Sample ID:	Total Depth of Well: 379.25
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume:
Date: 8/9/05	(b) 1 Filter Pack Water Volume:
Sampled By: DFT	(a)+(b)x3= Minimum Volume to Purge:
Method of ~~Sampling:~~ Development 4" Bailer	Method of ~~Purging:~~ Development 4" Bailer

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0902	1st*	Bailer	3	67.1°	7.76	1559	>1000					Dark Tan Fine Sand
0953	10th	Bailer	30	68.9°	7.64	1750	>1000					Tan Fine Sand
1046	20th	Bailer	60	70.2°	7.68	1813	>1000					Tan Fine Sand
1050	Surging well	w/	Surge	Block								
1156	30th	Bailer	90	72.3°	7.64	1994	>1000					Tan Fine Sand
1200	Surging well	w/	Surge	Block								
1323	40th	Bailer	120	74.3	7.78	1938	>1000					Tan none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0 0842	10.0 0846	Instrument reading	990 0848	Instrument reading	5.39 0852

Notes: * Bailer holds 3 gal

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-48F	Initial Depth to Water: 351.66
Sample ID:	Total Depth of Well: 379.25
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 18 gal
Date: 8/9/05	(b) 1 Filter Pack Water Volume:
Sampled By: DA	(a) + (b) x 3 = Minimum Volume to Purge: 54 gal
Method of ~~Sampling~~: Development 4" submersible	Method of ~~Purging~~: Development 4" submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1513	377	2.17	0									
1540	377	2.30	54	71.3	7.82	1856	751					cloudy none
1607	377	2.17	108	71.4	7.73	1822	26.1					cloudy none
1634	377	2.01	162	71.2	7.72	1800	8.35					clear none
1701	377	2.30	216	70.2	7.62	1772	4.05					clear none
702	Pump	off										

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
Instrument reading				Instrument reading		Instrument reading	

Notes: 27

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-48F	Initial Depth to Water: 351.66
Sample ID:	Total Depth of Well: 379.25
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 18 gal
Date: 8/10/05	(b) 1 Filter Pack Water Volume:
Sampled By: JAT	(a)+(b)x3= Minimum Volume to Purge: 54 gal
Method of ~~Sampling:~~ Development 4" Submersible	Method of ~~Purging:~~ Development 4" Submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0700	377	2.30	216									
0727	377	2.17	270	65.2	7.45	1571	4.69					clear none
0728	Pump	off	for	Recovery	Por	tion of pu	mp test,	Back	Flushed	5+	also	
0811	Parameters after Backflush			65.9	7.53	1616	258					cloudy none
0838	377	2.14	324	67.5	7.42	1639	16.2					clear none
0839	Pump	off	Backflu	shed	well	5x						
0900	Parameters after Backflush			67.4	7.43	1643	30.1					cloudy none
0927	377	2.14	378	68.3	7.39	1653	6.00					clear none
0928	Pump	off, Backflushed 5x										
0947	Parameters after Backflush			69.3	7.48	1666	9.50					clear none
1004	377	2.17	432	71.6	7.42	1712	3.14					clear none
1041	377	2.31	486	71.1	7.47	1698	3.03					clear none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0 0636	10.0 0641	Instrument reading	991 0645	Instrument reading	5.39 0648

27 54
Notes:

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-48F	Initial Depth to Water:
Sample ID:	Total Depth of Well:
Duplicate ID:	Well Diameter:
Sample Depth:	(a) 1 Casing Volume:
Date: 8/10/05	(b) 1 Filter Pack Water Volume:
Sampled By:	(a)+(b)x 3= Minimum Volume to Purge:
Method of Sampling:	Method of Purging:

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1108	377	2.17	540	71.2	7.42	1689	1.51					Clear none

pH Calibration (calibration solution)				Conductivity Meter Cal.			
Instrument reading				Instrument reading		Instrument reading	

Notes:

3440

74

Tuesday August 9, 2005
Weather: Sunny, warm ~80°
Wind: None

0741	Arrive at C-48F and start Setup
	SWL 351.66 TD 379.25
0840	Calibrated equipment
0902	1st Bailer Removed, Parameters Taken
0953	10th Bailer Removed, Parameters Taken
1046	20th Bailer Removed, Parameters Taken
1050	Surging well w/ surge Block
1156	30th Bailer Removed, Parameters Taken
1200	Surging well w/ surge Block
1323	40 th Bailer removed, Parameters Taken
1346	Lowering pump and piping
1510	Pump on establishing Flow
1513	Flow established at 2 gpm, Intake 377'
1701	Parameters stable Turbidity at 4.05 NTU's
1702	Pump off, will continue pumping and back Flushing tomorrow
1710	Decon Equipment
1732	Leaving C-48F → 90 day yard
1735	Arrive at 90 day yard, offloading ~300 gal of purge water
1749	Leaving 90 day yard → GWTP

Wednesday August 10, 2005
Weather: clear, warm ~80°
Wind: Breeze from South

0622	Arrive at C-48F and start Set up
0633	Calibrated Equipment
0700	Pump on, Draw down portion of pump Test Started
0701	Flow established at 2 gpm, Intake 37
0728	Pump off, for recovery portion of pump test also backflushed well 5x
0811	Pump on, Parameters Taken after Backflush
0839	Pump off, Backflushed well 5x
0900	Pump on, Parameters Taken after Backflush
0928	Pump off, Backflushed 5x
0947	Pump on, Parameters Taken after Backflush
1108	Parameters stable for 3 consecutive volumes Turbidity 1.51 NTU's
1110	Removing pump and piping
1246	Decon Equipment
1340	Leaving C-48F → 90 day yard
	Arrive at 90 day yard, offloading ~400
1344	gal of development water
1411	Leaving 90 day yard → GWTP

Figure C-2

AQUIFER TEST DATA

Owner Tooele Army Depot Address _____ County Tooele State UT

Date 8/10/05 Company performing test Parsons / Veolia Water Measured by Jeff Hammar

No. C-48F Distance from pumping well _____ Type of test Drawdown / Recovery Constant pumping Rate Test No. _____

Measuring equipment _____

Time Data
Pump on: Date 8/10/05 Time 0700 (t)
Pump off: Date 8/10/05 Time 0727 (t')
Duration of aquifer test:
Pumping 27 min Recovery 18 min

Water Level Data
Static water level 351.50
Measuring point BTOC
Elevation of measuring point _____

Discharge Data
How Q measured Flow meter
Depth of pump/air line 377 Ft
Previous pumping? Yes ____ No X
Duration _____ End _____

Comments on factors affecting test data

Date	Clock time	Time since pump started t	Time since pump stopped t'	t/t'	Depth to water / Water level measurement	Correction or Conversion	Water level	Water level change s or s'	Discharge measurement	(gpm) Rate		Comments
8/10/05	0700	0			351.50							Pumping started
	0701	1			351.58					2.30		
	0702	2			351.59					2.14		
	0703	3			351.59					2.30		
	0704	4			351.59					2.17		
	0705	5			351.59					2.17		
	0710	10			351.59					2.30		
	0715	15			351.59					2.30		
	0720	20			351.59					2.30		
	0725	25			351.59					2.17		
	0727	27			351.59					2.17		Pump off
	0728	28	1		351.50							
	0729	29	2		351.50							
	0730	30	3		351.50							
	0731	31	4		351.50							
	0732	32	5		351.50							
	0733	33	6		351.50							
	0735	35	8		351.50							
	0740	40	13		351.50							
	0745	45	18		351.50							

APPENDIX F

September 16, 2005
Weather: clear, warm, ~80°
Wind: From South

1104	Arrive at C-48F and Start Setup	08
	SWL 352.80' (BTOC)	
1137	Installed 4 samplers. 1 at 355 ft bgs, Top of Sampler, 1 at 363 ft bgs, Top of Sampler, 1 at 371 ft bgs, Top of Sampler, 1 at 379 ft bgs, ~~Bela~~ Bottom of Sampler	08 08 09 10
1154	Leaving C-48F → C-47F	10
1157	Arrive at C-47F and start Setup	10
	SWL 354.83 (BTOC)	10
1244	Installed 4 Samplers. 1 at 357 ft bgs, Top of Sampler, 1 at 364 ft bgs, Top of Sampler, 1 at 372 ft bgs, Top of sampler and 1 at 379 ft bgs, bottom of sampler	11 12 13
1254	Leaving C-47F → GWTP	13
		13
		14
		15
		15
		15
		15
		16

Tuesday October 11, 2005
Weather: Clear, Cool ~ 50°
Wind: None

0911 Arrive at D-18 and start Setup.
10 Cation Samples & Taken via Kabis Sampler, 500 mL poly w/ HNO3
10 Anion/Alkalinity Samples Taken via Kabis sampler, 500 mL poly. No preservative
(1037) (1) D-18FD001 (Cations) @ 155' bgs
(1044) (1) D-18FD001 (Anion/Alkalinity) @ 155' bgs
1055 (1) D-18GW001 (Cations) @ 155' bgs
1101 (1) D-18GW001 (Anions/Alkalinity) @ 155' bgs
1105 (1) D-18GMS001 (Cations) @ 155' bgs
1109 (1) D-18 MS001 (Anions/Alkalinity) at 155' bgs
1113 (1) D-18 SD001 (Cations) at 155' bgs
1118 (1) D-18 SD001 (Anions/Alkalinity) at 155' bgs
1125 (1) D-18 FR001 (Cations) at 155' bgs
1128 (1) D-18 FR001 (Anions/Alkalinity) at 155' bgs
1138 (1) D-18GW002 (Cations) at 165' bgs
1144 (1) D-18GW002 (Anions/Alkalinity) at 165' bgs
1151 (1) D-18GW003 (Cations) at 175' bgs
1156 (1) D-18GW003 (Anions/Alkalinity) at 175' bgs
1209 (1) D-18GW004 (Cations) at 180' bgs
1215 (1) D-18GW004 (Anions/Alkalinity) at 180' bgs
1223 (1) D-18GW005 (Cations) at 192 ft bgs
1229 (1) D-18GW005 (Anions/Alkalinity) at 192 ft bgs
1240 (1) D-18GW006 (Cations) at 205' bgs
1247 (1) D-18GW006 (Anions/Alkalinity) at 205' bgs
1255 Decon Sampler
1333 Leaving D-18 & GUTP

ANALYTICAL QUALITY CONTROL SUMMARY

Samples were collected in accordance with the analytical and quality control specifications of the Final Phase II RCRA Facility Investigation SWMU-58 Work Plan (Parsons, 2003) and the Tooele Industrial Area Project CDQMP and QAPP. Passive diffusion bag samplers were deployed in well C-48F on September 16, 2005. Samples including field quality control samples were collected on October 4, 2005 and submitted to Severn Trent Laboratories, a Utah and USACE-certified analytical laboratory.

Results were received and submitted to third party data review by Synectics. Data review included checks of the following data quality elements: Holding times, continuing calibration verification, method blanks, field blanks, laboratory control sample recovery, matrix spike and matrix spike duplicate recovery and precision, surrogate recovery, and field duplicate precision. There were minor quality control issues found in the data package for C-48F. The TCE results were J/UJ flagged for reanalysis holding times >14 days. 1,1-dichloroethene results were J/UJ flagged due to LCS % recovery issues. All data is suitable for use. Analytical and data validation reports are attached.

SEVERN TRENT STL®

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

October 30, 2005

STL SACRAMENTO PROJECT NUMBER: G5J070276
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on October 6, 2005. These samples are associated with your Tooele project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5J070276

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5J070276

General Comments

Samples were received at 2 degrees C.

WATER, 8260B, Volatile Organics

The samples were analysed for Volatile Organics by Method 8260B (GC-MS). Detection is achieved by purge and trap gas chromatography – Mass Spectrometry. All QC criteria were met except as noted below.

Samples 6, 8, 9, 10-14

Samples were all analyzed before the holding time expired. However, review of the data showed that 1 or more analytes were present in the sample at levels outside of the instrument calibration range. As a consequence, these samples were reanalyzed at dilutions, but the reanalysis was past the holding time date. Both sets of data will be reported.

Due to possible carry over contribution sample G5J070276-14 was reanalyzed two days beyond recommended hold time. Results for both analyses are reported.

There were no other anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5J070276

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HL9K7	1	D-19FD001	10/4/2005 08:05 AM	10/6/2005 09:10 AM
HL9LG	2	D-19GW001	10/4/2005 07:58 AM	10/6/2005 09:10 AM
HL9LR	3	D-19GW002	10/4/2005 08:07 AM	10/6/2005 09:10 AM
HL9LX	4	D-19GW003	10/4/2005 08:10 AM	10/6/2005 09:10 AM
HL9L4	5	D-17GW001	10/4/2005 08:36 AM	10/6/2005 09:10 AM
HL9L5	6	C-45FD001	10/3/2005 08:50 AM	10/6/2005 09:10 AM
HL9L8	7	C-45GW001	10/3/2005 08:41 AM	10/6/2005 09:10 AM
HL9MD	8	C-45GW002	10/3/2005 09:03 AM	10/6/2005 09:10 AM
HL9MH	9	C-45GW003	10/3/2005 09:08 AM	10/6/2005 09:10 AM
HL9MJ	10	C-48FGW001	10/4/2005 03:16 PM	10/6/2005 09:10 AM
HL9ML	11	C-48FGW002	10/4/2005 03:19 PM	10/6/2005 09:10 AM
HL9MQ	12	C-48FGW003	10/4/2005 03:22 PM	10/6/2005 09:10 AM
HL9MX	13	C-48FGW004	10/4/2005 03:26 PM	10/6/2005 09:10 AM
HL9M3	14	D-18GW007	10/4/2005	10/6/2005 09:10 AM
HL9NL	15	D-18GW008	10/4/2005	10/6/2005 09:10 AM
HL9NP	16	D-18GW009	10/4/2005	10/6/2005 09:10 AM
HL9NT	17	D-18GW010	10/4/2005	10/6/2005 09:10 AM
HL9NW	18	D-18GW011	10/4/2005	10/6/2005 09:10 AM
HL9N3	19	D-18GW012	10/4/2005	10/6/2005 09:10 AM
HL9N5	20	PARSTB12	10/3/2005 07:00 AM	10/6/2005 09:10 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 996

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-48F	C-48F	C-48FGW001	WG	DF	N	1	10/4/05	1516	JAS	355'	-	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	10/5/05 1000	[signature]	10/5/05 1000
[signature] To: FedEx	10/5/05 1630	[signature]	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

STL Sacramento (916) 373 - 5600

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 997

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-48F	C-48F	C-48FGW002	WG	DF	N	1	10/4/05	1519	gnt	363'	-	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 06 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	10/5/05 1000		10/5/05 1000
TO FED EX	10/5/05 1630		10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

STL Sacramento (916) 373 - 5600

CHAIN OF CUSTODY

PARSONS

COC ID: 998

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-48F	C-48F	C-48FGW003	WG	DF	N	1	10/4/05	1522	JNA	371'		3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature] To: FED Ex	10/5/05 1000 10/5/05 1630	[signature]	10/5/05 1000 10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 999

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-48F	C-48F	C-48FGW004	WG	DF	N	1	10/4/05	1526	JM	379'		3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 06 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	10/5/05 1000	[signature]	10/5/05 1000
[signature]	10/5/05 1630	[signature]	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 1018

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	FIELDQC	PARSTB12	WQ	NA	TB	1	10/3/05	0700	gnt	0	0	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Hannan	10/5/05 0800		10/5/05 0800
To: FedEx	10/5/05 1630	Jy Sadler	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

STL Sacramento (916) 373 - 5600

21 of 1112

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NV LOG # 34926

LOT# (QUANTIMS ID) G5J070276 QUOTE# 62837 LOCATION WB

	Initials	Date
DATE RECEIVED 10/6/05 TIME RECEIVED 0910	JS	10/6/05

DELIVERED BY
- [X] FEDEX
- [ ] CA OVERNIGHT
- [ ] CLIENT
- [ ] AIRBORNE
- [ ] GOLDENSTATE
- [ ] DHL
- [ ] UPS
- [ ] BAX GLOBAL
- [ ] GO-GETTERS
- [ ] STL COURIER
- [ ] COURIERS ON DEMAND
- [ ] OTHER

CUSTODY SEAL STATUS [X] INTACT [ ] BROKEN [ ] N/A

CUSTODY SEAL #(S) ~~396684~~ JS 396684, 438930

SHIPPPING CONTAINER(S) [ ] STL [X] CLIENT [ ] N/A

TEMPERTURE RECORD (IN °C) IR 1 [X] 3 [ ] [ ] OTHER _____

COC #(S) N/A

TEMPERATURE BLANK Observed: 2 Corrected: 2

SAMPLE TEMPERATURE

Observed: 2 2 3 Average: 2 Corrected Average: 2

COLLECTOR'S NAME: [ ] Verified from COC [X] Not on COC

pH MEASURED [ ] YES [ ] ANOMALY [X] N/A

LABELED BY..... CB 10/7/05

LABELS CHECKED BY.....

PEER REVIEW _____ [X] NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM [X] N/A

VOA-ENCORES [X] N/A

[ ] METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL [X] N/A

[X] COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES [ ] N/A

[ ] Clouseau [ ] TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 [X] N/A

[ ] WET ICE [ ] BLUE ICE [ ] GEL PACK [ ] NO COOLING AGENTS USED [ ] PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

WATER, 8260B, Volatile Organics

Parsons Corporation

Client Sample ID: C-48FGW001

GC/MS Volatiles

Lot-Sample #...: G5J070276-010 **Work Order #...:** HL9MJ1AA **Matrix.....:** WG
Date Sampled...: 10/04/05 **Date Received..:** 10/06/05
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.39 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.63 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	**0.10 J**	**1.0**	**ug/L**	**0.10**
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	**1.2**	**1.0**	**ug/L**	**0.36**
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**360 AA,D**	**20**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
1,2-Dichloroethane-d4	104	(70 - 130)
Toluene-d8	112	(70 - 130)
Dibromofluoromethane	105	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 20X dilution on 10/20/05

Parsons Corporation

Client Sample ID: C-48FGW002

GC/MS Volatiles

Lot-Sample #...: G5J070276-011 **Work Order #...:** HL9ML1AA **Matrix.....:** WG
Date Sampled...: 10/04/05 **Date Received..:** 10/06/05
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.44 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.48 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	**1.1**	**1.0**	**ug/L**	**0.36**
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**340 AA,D**	**20**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	101	(70 - 130)
1,2-Dichloroethane-d4	102	(70 - 130)
Toluene-d8	111	(70 - 130)
Dibromofluoromethane	109	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 20X dilution on 10/20/05

Parsons Corporation

Client Sample ID: C-48FGW003

GC/MS Volatiles

Lot-Sample #...: G5J070276-012 **Work Order #...:** HL9MQ1AA **Matrix.....:** WG
Date Sampled...: 10/04/05 **Date Received..:** 10/06/05
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.33 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.50 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	**0.12 J**	**1.0**	**ug/L**	**0.10**
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	**1.1**	**1.0**	**ug/L**	**0.36**
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**320 AA,D**	**20**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	101	(70 - 130)
1,2-Dichloroethane-d4	103	(70 - 130)
Toluene-d8	110	(70 - 130)
Dibromofluoromethane	104	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 20X dilution on 10/20/05

Parsons Corporation

Client Sample ID: C-48FGW004

GC/MS Volatiles

Lot-Sample #...: G5J070276-013 **Work Order #...:** HL9MX1AA **Matrix.....:** WG
Date Sampled...: 10/04/05 **Date Received..:** 10/06/05
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**0.36 J**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.56 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	**0.13 J**	**1.0**	**ug/L**	**0.10**
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	**0.18 J**	**1.0**	**ug/L**	**0.10**
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	**1.2**	**1.0**	**ug/L**	**0.36**
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**300 AA,D**	**10**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	107	(70 - 130)
Toluene-d8	115	(70 - 130)
Dibromofluoromethane	109	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 10X dilution on 10/20/05

Parsons Corporation

Client Sample ID: PARSTB12

GC/MS Volatiles

Lot-Sample #...: G5J070276-020 **Work Order #...:** HL9N51AA **Matrix.....:** WQ
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	ND	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
1,2-Dichloroethane-d4	93	(70 - 130)
Toluene-d8	107	(70 - 130)
Dibromofluoromethane	98	(70 - 130)

QC DATA ASSOCIATION SUMMARY

G5J070276

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WG	SW846 8260B		5292173	
002	WG	SW846 8260B		5292173	
003	WG	SW846 8260B		5292173	
004	WG	SW846 8260B		5292173	
005	WG	SW846 8260B		5292173	
006	WG	SW846 8260B		5291444	5291272
007	WG	SW846 8260B		5291444	5291272
008	WG	SW846 8260B		5291444	5291272
009	WG	SW846 8260B		5291444	5291272
010	WG	SW846 8260B		5292173	
011	WG	SW846 8260B		5292173	
012	WG	SW846 8260B		5292173	
013	WG	SW846 8260B		5292173	
014	WG	SW846 8260B		5292173	
015	WG	SW846 8260B		5292173	
016	WG	SW846 8260B		5292302	
017	WG	SW846 8260B		5292302	
018	WG	SW846 8260B		5292302	
019	WG	SW846 8260B		5292302	
020	WQ	SW846 8260B		5291444	5291272

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AA **Matrix.....:** WATER
MB Lot-Sample #: G5J180000-444

Prep Date.....: 10/17/05
Analysis Date..: 10/17/05 **Prep Batch #...:** 5291444
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	105	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
Toluene-d8	102	(70 - 130)
Dibromofluoromethane	92	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AA **Matrix.....:** WATER
MB Lot-Sample #: G5J190000-173

Prep Date.....: 10/18/05
Analysis Date..: 10/18/05 **Prep Batch #...:** 5292173
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	96	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	102	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AA **Matrix.....:** WATER
MB Lot-Sample #: G5J190000-302

Prep Date.....: 10/18/05
Analysis Date..: 10/18/05 **Prep Batch #...:** 5292302
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	114	(70 - 130)
1,2-Dichloroethane-d4	125	(70 - 130)
Toluene-d8	119	(70 - 130)
Dibromofluoromethane	122	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AC **Matrix.....:** WATER
LCS Lot-Sample#: G5J180000-444
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Benzene	**91**	**(80 - 120)**	**SW846 8260B**
1,1-Dichloroethene	**89**	**(80 - 120)**	**SW846 8260B**
Toluene	**95**	**(80 - 120)**	**SW846 8260B**
Trichloroethene	**88**	**(80 - 120)**	**SW846 8260B**
Chlorobenzene	**99**	**(80 - 120)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AC **Matrix.....:** WATER
LCS Lot-Sample#: G5J180000-444
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	**20.0**	**18.2**	**ug/L**	**91**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**17.8**	**ug/L**	**89**	**SW846 8260B**
Toluene	**20.0**	**18.9**	**ug/L**	**95**	**SW846 8260B**
Trichloroethene	**20.0**	**17.7**	**ug/L**	**88**	**SW846 8260B**
Chlorobenzene	**20.0**	**19.8**	**ug/L**	**99**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**97**	**(80 - 120)**			**SW846 8260B**
	105	**(80 - 120)**	**7.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**89**	**(80 - 120)**			**SW846 8260B**
	102	**(80 - 120)**	**13**	**(0-30)**	**SW846 8260B**
Toluene	**102**	**(80 - 120)**			**SW846 8260B**
	108	**(80 - 120)**	**6.3**	**(0-30)**	**SW846 8260B**
Trichloroethene	**93**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**7.2**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**101**	**(80 - 120)**			**SW846 8260B**
	110	**(80 - 120)**	**8.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**20.0**	**19.5**	**ug/L**	**97**		**SW846 8260B**
	20.0	**21.0**	**ug/L**	**105**	**7.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**17.9**	**ug/L**	**89**		**SW846 8260B**
	20.0	**20.3**	**ug/L**	**102**	**13**	**SW846 8260B**
Toluene	**20.0**	**20.4**	**ug/L**	**102**		**SW846 8260B**
	20.0	**21.7**	**ug/L**	**108**	**6.3**	**SW846 8260B**
Trichloroethene	**20.0**	**18.7**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.1**	**ug/L**	**100**	**7.2**	**SW846 8260B**
Chlorobenzene	**20.0**	**20.3**	**ug/L**	**101**		**SW846 8260B**
	20.0	**22.0**	**ug/L**	**110**	**8.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292302
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**91**	**(80 - 120)**			**SW846 8260B**
	98	**(80 - 120)**	**7.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**80**	**(80 - 120)**			**SW846 8260B**
	96	**(80 - 120)**	**18**	**(0-30)**	**SW846 8260B**
Toluene	**93**	**(80 - 120)**			**SW846 8260B**
	101	**(80 - 120)**	**8.6**	**(0-30)**	**SW846 8260B**
Trichloroethene	**90**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**9.9**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**96**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**3.6**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292302
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**20.0**	**18.1**	**ug/L**	**91**		**SW846 8260B**
	20.0	**19.6**	**ug/L**	**98**	**7.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**15.9**	**ug/L**	**80**		**SW846 8260B**
	20.0	**19.1**	**ug/L**	**96**	**18**	**SW846 8260B**
Toluene	**20.0**	**18.5**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.2**	**ug/L**	**101**	**8.6**	**SW846 8260B**
Trichloroethene	**20.0**	**18.1**	**ug/L**	**90**		**SW846 8260B**
	20.0	**19.9**	**ug/L**	**100**	**9.9**	**SW846 8260B**
Chlorobenzene	**20.0**	**19.3**	**ug/L**	**96**		**SW846 8260B**
	20.0	**20.0**	**ug/L**	**100**	**3.6**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HL9L81AC-MS **Matrix.....:** WG
MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 10

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**108**	**(70 - 130)**			**SW846 8260B**
	110	**(70 - 130)**	**2.0**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**123**	**(70 - 130)**			**SW846 8260B**
	124	**(70 - 130)**	**1.6**	**(0-30)**	**SW846 8260B**
Toluene	**114**	**(70 - 130)**			**SW846 8260B**
	116	**(70 - 130)**	**1.5**	**(0-30)**	**SW846 8260B**
Trichloroethene	**103**	**(70 - 130)**			**SW846 8260B**
	105	**(70 - 130)**	**0.75**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**111**	**(70 - 130)**			**SW846 8260B**
	113	**(70 - 130)**	**2.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HL9L81AC-MS **Matrix.....:** WG
MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**200**	**215**	**ug/L**	**108**		**SW846 8260B**
	ND	**200**	**220**	**ug/L**	**110**	**2.0**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**200**	**245**	**ug/L**	**123**		**SW846 8260B**
	ND	**200**	**249**	**ug/L**	**124**	**1.6**	**SW846 8260B**
Toluene	**ND**	**200**	**228**	**ug/L**	**114**		**SW846 8260B**
	ND	**200**	**232**	**ug/L**	**116**	**1.5**	**SW846 8260B**
Trichloroethene	**280**	**200**	**489**	**ug/L**	**103**		**SW846 8260B**
	280	**200**	**493**	**ug/L**	**105**	**0.75**	**SW846 8260B**
Chlorobenzene	**ND**	**200**	**222**	**ug/L**	**111**		**SW846 8260B**
	ND	**200**	**227**	**ug/L**	**113**	**2.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

AUTOMATED DATA REVIEW SUMMARY

Facility:	SWMU 58
Event:	2004_2005 SWMU 58 Phase II RFI GW
Contract:	9T9H213C
Sample Delivery Group:	G5J070276
Field Contractor:	Parsons Engineering Science, Salt Lake City
Laboratory Contractor:	SEVERN TRENT LABS., WEST SACRAMENTO, CA
Data Review Contractor:	Synectics, Sacramento, CA
Guidance Document:	*Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003*

Analytical Method	Normal Samples	Field QC Samples
SW8260B	18	2

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistant with the requirements contained in Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003 to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as "J/UJ", the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by Parsons Engineering Science, Salt Lake City; analyses were performed by SEVERN TRENT LABS., WEST SACRAMENTO, CA and were reported under sample delivery group (SDG) G5J070276. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative. The following quality control elements were evaluated during this review effort:

Technical Holding Times
Continuing Calibration Verification
Method Blank Contamination
Field Blank Contamination
Blank Spike Accuracy
Blank Spike Precision
Matrix Spike Accuracy
Matrix Spike Precision
Surrogate Recovery
Laboratory Duplicate Precision
Field Duplicate Precision

A minimum of ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following reports were generated during the evaluation of this data set and are presented as attachments to this report as applicable.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outlier Report.

Field Duplicate – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the ADR narrative.

Out of control events experienced by the laboratory have warranted the qualification of 2.6% (11 results) and the rejection of 0 % (0 results) of the data set. These deficiencies are detailed in the referenced attachments, and discussed in the ADR narrative, where appropriate.

Released by

Date

Reason and Comment Codes

Code	Definition
C1	Diluted Out
C2	Flag Parent Only
C2S	Flag Parent (Soil); Batch (Water)
C3	No Action
C4	No QC Outliers
C5	One or both values <5x RL
C6	Recalculated Value
C7	Material Blanks
C8	Spike Insignificant
C9	No Flags; set to ND by method/cal. blank

Reasons

Code	Definition
A	Serial dilution
B	Calibration Blank - Negative
	Negative Blank
B1	Blank
B2	Calibration Blank
C	Continuing Calibration Verification
	Continuing Calibration Verification RRF
D	BS RPD
	Field Duplicate RPD
D1	Lab Replicate RPD
D2	MS RPD
E	Exceeds LinearCalibration Range
F	Hydrocarbon pattern does not match standard
G	Initial Calibration RRF
	Initial Calibration RSD
H	Test Hold Time
	Prep Hold Time
I	Internal standard
K1	Equip Blank
K2	Field Blank
K3	Trip Blank
L	LCS Recovery
M	MS Recovery
N	Blank - No Action
O	Interference check sample
P	Column RPD
Q	Material Blank
S	Surrogate
T	Receipt Temperature
TI	Tentatively Identified Compound
TR	Trace Level Detect
W	Column breakdown (pesticides)
X	Raised reporting limit
Y	Analyte not confirmed on second column

ADR CASE NARRATIVE

Laboratory ID: G5J070276

Prior to loading and processing data, modifications to the project setup may be requested by the laboratory and/or contractor, and approved by the client. These modifications allow the loading of data that was not in complete agreement with the project guidance document; in some cases, variances to the project document may be in process, in others, the changes are required to accept data that had not been generated in compliance with the project guidance document. All project setup modifications are listed below:

There were no project setup modifications associated with this sample delivery group.

Chemistry Data Quality

The data submission process incorporates a series of stored procedures designed to identify conditions in electronic data deliverables (EDD) that would affect chemistry data quality. These conditions will not result in the qualification of the data; however, these findings should be reviewed for possible contractual non-compliance. A brief explanation of each finding encountered for this data set and the potential impact on chemistry data quality is summarized below.

There were no issues affecting chemistry data quality associated with this sample delivery group.

Data Verification

The data verification process includes a manual review of information on the chains of custody and laboratory case narratives, a check of all rejected results and a minimum of 10 percent of sample and QC results for consistency with hard copy reports, and a cursory review of all reports generated during the automated review process. The following comments are associated with the verification process:

1. **Volatiles by SW8260**

   An matrix spike (MS) was not provided on the EDD for the analytical batch for this SDG. No qualifiers have been applied on this basis.

   It was noted that the data flagging system could not determine the hold times for the reanalysis of samples C-45FD001, C-45GW002, C-45GW003, C-48FGW001, C-48FGW002, C-48FGW003, and C-48FGW004 due to 2 sets of surrogates being provided for the same samples. The data was manually reviewed and the reanalysis were found to be outside project warning limits. TCE was flagged as estimated as seen in the Qualified Results report.

All of the reports utilized during the data verification process are provided as attachments to this report.

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP101018	NA	NA	LABQC	WQ		HSL020	10/18/2005 1:56:00PM	CV6
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 3:31:00PM	BS1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 4:13:00PM	BD1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 5:14:00PM	LB1
	5292302	NA	D-18	WG	D-18GW009	G5J070276016	10/18/2005 5:48:00PM	N1
	5292302	NA	D-18	WG	D-18GW010	G5J070276017	10/18/2005 6:13:00PM	N1
	5292302	NA	D-18	WG	D-18GW011	G5J070276018	10/18/2005 6:37:00PM	N1
	5292302	NA	D-18	WG	D-18GW012	G5J070276019	10/18/2005 7:02:00PM	N1
HP71014	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV1
	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV3
HP71020	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AM	CV2
	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AM	CV7
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AM	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AM	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PM	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PM	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PM	LB1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PM	LB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1
HP91006	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:22:00PM	CV1
	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:45:00PM	CV2

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP91017	NA	NA	LABQC	WQ		HSL020	10/17/2005 12:00:00PM	CV4
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 12:36:00PM	BS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 2:49:00PM	MS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 3:12:00PM	SD1
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 3:58:00PM	LB1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 4:20:00PM	N1
	5291444	NA	C-45	WG	C-45FD001	G5J070276006	10/17/2005 4:43:00PM	FD1
	5291444	NA	C-45	WG	C-45GW002	G5J070276008	10/17/2005 5:06:00PM	N1
	5291444	NA	C-45	WG	C-45GW003	G5J070276009	10/17/2005 5:29:00PM	N1
	5291444	NA	FIELDQC	WQ	PARSTB12	G5J070276020	10/17/2005 5:52:00PM	TB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
HP91018	NA	NA	LABQC	WQ		HSL020	10/18/2005 10:46:00AM	CV5
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:20:00AM	BS1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:57:00AM	BD1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 12:43:00PM	LB1
	5292173	NA	D-19	WG	D-19FD001	G5J070276001	10/18/2005 4:46:00PM	N1
	5292173	NA	D-19	WG	D-19GW001	G5J070276002	10/18/2005 5:09:00PM	N1
	5292173	NA	D-19	WG	D-19GW002	G5J070276003	10/18/2005 5:32:00PM	N1
	5292173	NA	D-19	WG	D-19GW003	G5J070276004	10/18/2005 5:55:00PM	N1
	5292173	NA	D-17	WG	D-17GW001	G5J070276005	10/18/2005 6:18:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW001	G5J070276010	10/18/2005 6:41:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW002	G5J070276011	10/18/2005 7:03:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW003	G5J070276012	10/18/2005 7:27:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW004	G5J070276013	10/18/2005 7:49:00PM	N1
	5292173	NA	D-18	WG	D-18GW007	G5J070276014	10/18/2005 8:12:00PM	N1

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP91018	5292173	NA	D-18	WG	D-18GW008	G5J070276015	10/18/2005 8:35:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1

QC Outliers

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: 9T9H213C

SDG G5J070276

Test/Leach	QCElement	Sample	Type	Dil'n	Analyte	Result	Units	Warning Limits	Control Limits	Qualifier	Reason	Cmnt.
SW8260B/NONE	Fld. RPD	C-45FD001	FD1	10.00	Trichloroethene (TCE)	38	RPD	<25	< 25	None	D	C2
SW8260B/NONE	LCS %R	P5292302LABQC	BS1	1.00	1,1-Dichloroethene	80	%	80 - 120	10 - 120	J / UJ	L	

Detected Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Carbon Tetrachloride	1.0	3.4		3.4		UG/L	
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32	J	0.32	J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190		190	J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4	J	3.4	J	UG/L	TR
SW8260B/NONE	WG	C-45GW001	N	Trichloroethene (TCE)	10	280		280		UG/L	
SW8260B/NONE	WG	C-45GW002	N	Carbon Tetrachloride	1.0	3.2		3.2		UG/L	
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35	J	0.35	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200		200	J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Carbon Tetrachloride	1.0	3.0		3.0		UG/L	
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29	J	0.29	J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180		180	J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	1,1-Dichloroethene	1.0	1.2		1.2		UG/L	
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39	J	0.39	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63	J	0.63	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10	J	0.10	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360		360	J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	1,1-Dichloroethene	1.0	1.1		1.1		UG/L	
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44	J	0.44	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48	J	0.48	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340		340	J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	1,1-Dichloroethene	1.0	1.1		1.1		UG/L	
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33	J	0.33	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50	J	0.50	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12	J	0.12	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320		320	J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13	J	0.13	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethene	1.0	1.2		1.2		UG/L	

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36	J	0.36	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56	J	0.56	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300		300	J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43	J	0.43	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-18GW007	N	Trichloroethene (TCE)	1.0	5.0		5.0		UG/L	
SW8260B/NONE	WG	D-18GW008	N	Trichloroethene (TCE)	1.0	4.4		4.4		UG/L	
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15	J	0.15	J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	Trichloroethene (TCE)	1.0	3.9		3.9		UG/L	
SW8260B/NONE	WG	D-18GW010	N	Trichloroethene (TCE)	1.0	3.7		3.7		UG/L	
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16	J	0.16	J	UG/L	TR
SW8260B/NONE	WG	D-18GW011	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-18GW012	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66	J	0.66	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22	J	0.22	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Trichloroethene (TCE)	1.0	5.9		5.9		UG/L	
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57	J	0.57	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25	J	0.25	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Trichloroethene (TCE)	1.0	6.0		6.0		UG/L	
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76	J	0.76	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20	J	0.20	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Trichloroethene (TCE)	1.0	6.3		6.3		UG/L	
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73	J	0.73	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23	J	0.23	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Trichloroethene (TCE)	1.0	6.6		6.6		UG/L	

Qualified Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32	J	0.32	J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190		190	J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4	J	3.4	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35	J	0.35	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200		200	J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29	J	0.29	J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180		180	J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39	J	0.39	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63	J	0.63	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10	J	0.10	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360		360	J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44	J	0.44	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48	J	0.48	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340		340	J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33	J	0.33	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50	J	0.50	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12	J	0.12	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320		320	J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13	J	0.13	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36	J	0.36	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56	J	0.56	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300		300	J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43	J	0.43	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15	J	0.15	J	UG/L	TR

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	D-18GW010	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16	J	0.16	J	UG/L	TR
SW8260B/NONE	WG	D-18GW012	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66	J	0.66	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22	J	0.22	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57	J	0.57	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25	J	0.25	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76	J	0.76	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20	J	0.20	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73	J	0.73	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23	J	0.23	J	UG/L	TR

DATA MANAGEMENT NARRATIVE

Laboratory ID: G5J070276

Data Submission

The data submission process incorporates a series of stored procedures designed to identify valid value (VVL), logical (LE), and project specific errors (PSE) in electronic data deliverables (EDD). Automated data review (ADR) is most efficient when data generators correct all errors. Dependent primarily upon the electronic reporting capabilities of the data generator, the severity of the logical and project specific errors listed below have been reduced to warnings. A warning log is generated with each data submission and is presented as an attachment to this report. A brief explanation of each error encountered for this data set and the potential impact on data quality is summarized below.

1. **Logical Error (LE) spLE01_ANADATE_Unique**
   This logical error occurs when multiple analyses are submitted within the same analytical batch that have identical analysis dates and times. This occurs in the laboratory when instruments are able to perform analyses in less than one minute, as ERPIMS specification records time only to the minute. However, it can also occur if the time of analysis is not recorded by an instrument, and the laboratory analyst reports all measurements in a batch with the same time. Whenever possible, actual times of analysis should be recorded and reported.

2. **Project Specific Error (PSE) spPSE01L_Invalid_Units_QC**
   This PSE occurs when laboratory quality control samples are reported with units of percent as opposed to true values. This inconsistency does not affect data quality, unless the submittal is scheduled for delivery to the AFCEE in accordance with the ERPIMS 4.0 specification. Automated data review can be performed for laboratory QC when units are reported in percent or in concentration units. However, to avoid this warning on future submittals, the laboratory would need to report these values in units of concentration (i.e., ug/L).

3. **Logical Error (LE) spLE01_QAPPFLAGS_F**
   This LE warning occurs when there are positive results less than the RL and associated QAPPFLAGS are not “F”. This requirement is only necessary if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply QAPPFLAGS of “F” whenever the detected result is less than the RL.

4. **Valid Value List (VVL) spVVL32_LABLOTCTL**
   This warning occurs when the laboratory does not include the preparation batch number (LABLOTCTL). The LABLOTCTL field should be populated with the same ID for all field and QC samples extracted/prepared in the same batch. To avoid this warning on future submittals, populate the LABLOTCTL field.

5. **Valid Value List (VVL) spVVL33_CALREFID**
   This valid value warning occurs when the laboratory does not include the calibration reference ID (CALREFID). To avoid this warning in the future, the laboratory should include the CALREFID on the electronic data.

6. **Valid Value List (VVL) spVVL56_QAPPFLAGS**
   This valid value warning occurs when there are QAPPFLAGS in the file that are not official AFCEE qualifiers. Using the official AFCEE qualifiers is necessary only if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply only AFCEE qualifiers to the QAPPFLAGS field.

A detailed description of the stored procedures utilized during the data submission process is provided as an attachment to this report (Submission Warnings).

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

---

LE

Query Name	Finding	Record Count
spLE01_ANADATE_Unique	ANMCODE is SW8260B; ANADATE is Oct 20 2005 11:23AM; ANALOT is HP71020	2
	ANMCODE is SW8260B; ANADATE is Oct 14 2005 5:57PM; ANALOT is HP71014	2

PSE

Query Name	Finding	Record Count
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is N/STD; UNITS is percent	87
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BD/STD; UNITS is percent	9
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is MS/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is FD/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is SD/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/ORG; UNITS is PERCENT	106
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/STD; UNITS is percent	27
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is TB/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is LB/STD; UNITS is percent	12

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.3300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 3.4000; RL is 10.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5600; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

---

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5700; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4800; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2200; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1800; RL is 1.0000; QAPPFLAGS is J	2
	PARVQ is TR; PARVAL is 0.4400; RL is 1.0000; QAPPFLAGS is J	1
spVVL32_LABLOTCTL	LABLOTCTL is Null	133
spVVL33_CALREFID	CALREFID is Null	655
spVVL56_QAPPFLAGS	QAPPFLAGS is Uq	1

Total Record Count: 788
Error Count: 0
Warning Count: 1,103

DATA ENTRY SHEET

GW-ADV Version 3.0; 02/03

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES: X

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79016	1.20E+03	Trichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	10729	10729	0	0	A	S	S		

MORE ↓

Don't Use Look-Up!

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	244	0.1	0.83	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-04	1
				Used to calculate risk-based groundwater concentration.	

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.47E+03	1.1E-04	4.0E-02

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	10714	0.321	ERROR	ERROR	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
5.63E+04	1.06E+06	3.77E-04	15	8,544	5.05E-03	2.17E-01	1.76E-04	1.28E-02	0.00E+00	0.00E+00	5.09E-04	1.23E-02	10714

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.60E+05	0.10	9.95E+01	1.28E-02	4.00E+02	4.15E+84	2.14E-05	5.55E+00	1.1E-04	4.0E-02

END

The predicted groundwater concentration of 1200 ug/L was calculated using the J&E groundwater model and soil gas data. TCE was measured at a concentration of 49,000 ppbv at 336 ft bgs in soil gas. This concentration of TCE was converted to 260,000 ug/m^3, which is the unit for soil gas used in the model. The depth to groundwater is 352 ft bgs. These input parameters were used to predict the concentration of TCE in the groundwater by assuming that the attenuation from 352 to 336 ft was minimal. Therefore the depth of 10729 cm (depth to goundwater 352 ft bgs) to the top of contamination was used in the model but did not make a difference in the C_{source} calculation. Concentrations of TCE were entered until a C_{source} concentration of 260,000 ug/m^3 soil gas was displayed in the intercalcs sheet. Therefore, with the assumption that attenuation from 352 to 336 ft bgs was minimal, the groundwater concentration predicted from soil gas results (from VSG wells 013 and 014 at building 615) is 1200 ug/L based on the results of the J&E model.

APPENDIX G

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: **Dean Reynolds, TEAD; Larry McFarland, TEAD**

Copy: **Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons**

From: **Amanda Evans, Parsons**

Date: **Friday, August 26, 2005**

Subject: **TEAD SWMU-58 RFI - Waste Management**

This letter is to recommend disposition of the two roll offs PARSNZ0520901 and PARSNZ0521301 summarized in Table One, attached. The waste was generated in association with the drilling of well C-48F.

Two roll offs of soil cutting waste were generated and one composite sample was taken for these two roll offs. The sample was labeled IDW59. Samples were analyzed for TCLP VOCs. Analysis was conducted by Severn Trent Services, Inc, North Canton, OH. This laboratory is Utah Certified.

Results have been received as data packages and electronic data deliverables. Parsons has reviewed the data and found QC to be acceptable. Analytical results and case narrative are attached in portable document format.

Listed Wastes Analysis:

No constituents were detected. Therefore no listed waste codes should be applied.

Characteristic Wastes Analysis:

The waste is known to be primarily soil. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No constituents were detected. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Disposition:

Since well C-48F is located under a concrete slab east of Lodestone near Bldg 615, Parsons recommends the drill cuttings be transferred to a location recommended by UID personnel.

Parsons will arrange to dispose of the waste per your written instructions.

Table One

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0520901	KLA	YES		20 CU YD	C-48	SOIL	7/28/2005	7/29/2005	7/28/2005	**10/16/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-48	UID-90	7/29/2005		
	C-48	7/28/2005		

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0521301	KLA	YES		20 CU YD	C-48	SOIL	8/1/2005	8/2/2005	8/1/2005	**10/20/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-48	UID-90	8/2/2005		
	C-48	8/1/2005		

From: McFarland, Larry [larry.mcfarland@us.army.mil]
Sent: Monday, August 29, 2005 9:11 AM
To: Evans, Amanda
Cc: Alloway, Kurt; Jirik, Richard; Reynolds, Dean (Environmental)
Subject: TEAD IDW-47 and IDW-48F

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated August 26, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW-47 and IDW-48F. TEAD concurs with Parsons recommended disposition. As the following containers were generated from the installation of monitoring wells under concrete near building 615, Parsons should dispose of the cuttings in a location to be coordinated with the Utah Industrial Depot.

PARSNZ0522001 (well C-47)
PARSNZ0521701 (well C-47)
PARSNZ0520901 (well C-48F)
PARSNZ0521301 (well C-48F)

Larry McFarland
Environmental Office, SJMTE-CS-EO
1 Tooele Army Depot, Building 8
Tooele, Utah 84074-5003
Phone (435) 833-3235 Fax (435) 833-2839
larry.mcfarland@us.army.mil

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

August 22, 2005

STL SACRAMENTO PROJECT NUMBER: G5H090184
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on August 9, 2005. This sample is associated with your Tooelle project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were provided by E-mail on August 18, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5H090184

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5H090184

General Comments

Sample was received at 4 degrees Centigrade. It was sent to STL North Canton on 8/09/05 where it was received at 3.2 degrees Centigrade.

SOLID, SW 1311/8260B, TCLP/Volatile Organics

Sample(s): 1

Samples were analysed by method SW 1311/8260B, a TCLP extraction followed by gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met.

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5H090184

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HG66P	1	IDW59	8/3/2005 01:00 PM	8/9/2005 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G5H090184

CHAIN OF CUSTODY

PARSONS

COC ID: 987

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW59	IDW59	SD	G	N	1	03AUG2005	1300	KLA	0	380'	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
TCLPVOC	SVLS		2			

Remarks:

PARSNZ052090 1
PARSNZ052130 1
C-48 F

5 DAY TURN-AROUND REQUESTED

RECEIVED IN GOOD CONDITION
UNDER COC
AUG 9 2005
INI:

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
To: FED EX	08AUG2005/1330		

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, August 05, 2005

STL Sacramento (916) 373 - 5600

Severn Trent Laboratories, Inc
SAMPLE ANALYSIS REQUISITION

LABORATORY: STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

NEED ANALYTICAL REPORT BY
8/14/05

C228
TB
8/10/05

ATTN:

LAB PURCHASE ORDER: SR071400

CLIENT CODE: 368391 PROJECT MANAGER: Nilo Ligi

NUMBER OF SAMPLES IN LOT: 0001

SAMPLE I.D.	SAMPLING DATE	ANALYSIS REQUIRED
G5H090184-001	8/03/05	Volatile Organics, GC/MS (8260B)
HG66P-1-AA		(MS8260TP) METHOD: 8260B

2 x 250

TCLP + MS sheets printed.

NEED DETECTION LIMIT AND ANALYSIS DATE INCLUDED IN REPORT.

SHIPPING METHOD: DATE: 8/09/05

SEND REPORT TO:

SAMPLE RECEIVED BY: _____ DATE: _____

PLEASE SEND A SIGNED COPY OF THIS FORM WITH REPORT AT COMPLETION OF ANALYSIS.

THANK YOU.

STL Sacramento
INT: _____ 8/09/05 11:49:46
STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

RELINQUISHED BY: _____ DATE/TIME: 8-9-05 - 15:00

RELINQUISHED BY: _____ DATE/TIME: _____

RECEIVED FOR LAB BY: Keith A Miller DATE/TIME: 8-10-05 9:20

PLEASE RETURN ORIGINAL SAMPLE ANALYSIS REQUISITION

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NL LOG # 33956

LOT# (QUANTIMS ID) G5H090184 QUOTE# 42887 LOCATION WHS

		Initials	Date
DATE RECEIVED	8/9/05	AM	8/9/05
TIME RECEIVED	9:00		

DELIVERED BY
- ☑ FEDEX
- ☐ CA OVERNIGHT
- ☐ CLIENT
- ☐ AIRBORNE
- ☐ GOLDENSTATE
- ☐ DHL
- ☐ UPS
- ☐ BAX GLOBAL
- ☐ GO-GETTERS
- ☐ STL COURIER
- ☐ COURIERS ON DEMAND
- ☐ OTHER

CUSTODY SEAL STATUS ☐ INTACT ☐ BROKEN ☑ N/A

CUSTODY SEAL #(S) N/A

SHIPPPING CONTAINER(S) ☑ STL ☐ CLIENT ☑ N/A

TEMPERTURE RECORD (IN °C) IR 1☐ 3☑ ☐ OTHER

COC #(S) 987 N/A AM 8/9/05

TEMPERATURE BLANK Observed: N/A Corrected: N/A

SAMPLE TEMPERATURE

Observed: 3 4 N/A Average: 4 Corrected Average: 4

COLLECTOR'S NAME: ☐ Verified from COC ☑ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW _____ ☑ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM ☑ N/A

VOA-ENCORES ☑ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☑ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE. INITIAL AND DATE ALL "N/A" ENTRIES.

STL Cooler Receipt Form/Narrative **Lot Number:**_____

North Canton Facility

Client: STL Sacramento Project:_____ Quote#:_____

Cooler Received on: 8-10-05 Opened on: 8-10-05 by: Keith R Miller (Signature)

Fedx ☒ Client Drop Off ☐ UPS ☐ DHL ☐ FAS ☐ Other:_____

STL Cooler No#_____ Foam Box ☐ Client Cooler ☒ Other____

1. Were custody seals on the outside of the cooler? Yes ☒ No ☐ Intact? Yes ☒ No ☐ NA ☐
   If YES, Quantity 1
   Were the custody seals signed and dated? Yes ☒ No ☐ NA ☐
2. Shipper's packing slip attached to this form? Yes ☒ No ☐ NA ☐
3. Did custody papers accompany the samples? Yes ☒ No ☐ Relinquished by client? Yes ☒ No ☐
4. Did you sign the custody papers in the appropriate place? Yes ☒ No ☐
5. Packing material used: Bubble Wrap ☒ Foam ☐ None ☐ Other :_____
6. Cooler temperature upon receipt 3.2 °C (see back of form for multiple coolers/temp)

METHOD: Temp Vial ☐ Coolant & Sample ☐ Against Bottles ☐ IR ☒ ICE/H_2O Slurry ☐

COOLANT: Wet Ice ☒ Blue Ice ☐ Dry Ice ☐ Water ☐ None ☐

7. Did all bottles arrive in good condition (Unbroken)? Yes ☒ No ☐
8. Could all bottle labels and/or tags be reconciled with the COC? Yes ☒ No ☐
9. Were samples at the correct pH? (record below/on back) Yes ☐ No ☐ NA ☒
10. Were correct bottles used for the tests indicated? Yes ☒ No ☐
11. Were air bubbles >6 mm in any VOA vials? Yes ☐ No ☐ NA ☒
12. Sufficient quantity received to perform indicated analyses? Yes ☒ No ☐

Contacted PM _____ Date:_____ by:_____ via Voice Mail ☐ Verbal ☐ Other ☐

Concerning:_____

√	

1. CHAIN OF CUSTODY

The following discrepancies occurred:

_____

_____

_____

_____

2. SAMPLE CONDITION

Sample(s)_____ were received after the recommended holding time had expired.

Sample(s)_____ were received in a broken container.

3. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in sample receiving to meet recommended pH level(s). *Nitric Acid Lot # 051105-HNO3; Sulfuric Acid Lot # 102804-H2SO4; Sodium Hydroxide Lot # -041305 -NaOH; Hydrochloric Acid Lot # 100504-HCl; Sodium Hydroxide and Zinc Acetate Lot # 071604-CH3COO2ZN/NaOH*

Sample(s)_____ were received with bubble > 6 mm in diameter (cc: PM)

4. Other (see below or back)

Client ID	pH	Date	Initials

SOP: NC-SC-0005, Sample Receiving
N:\QAQC\NARRATIV\STL\Cooler Receipt STL\COOLER_STL_Rev49 062205.doc

SOLID, 8260B, Vol. Org.
TCLP NCanton

Parsons Corporation

Client Sample ID: IDW59

TCLP GC/MS Volatiles

Lot-Sample #...: G5H090184-001 **Work Order #...:** HG66P1AA **Matrix.....:** SOLID
Date Sampled...: 08/03/05 **Date Received..:** 08/09/05
Leach Date.....: 08/11/05 **Prep Date.....:** 08/14/05 **Analysis Date..:** 08/14/05
Leach Batch #..: P522403 **Prep Batch #...:** 5226055
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00023
Carbon tetrachloride	ND	0.025	mg/L	0.00045
Chlorobenzene	ND	0.025	mg/L	0.00028
Chloroform	ND	0.025	mg/L	0.00040
1,2-Dichloroethane	ND	0.025	mg/L	0.00048
1,1-Dichloroethylene	ND	0.070	mg/L	0.00060
Methyl ethyl ketone	ND	0.25	mg/L	0.0010
Tetrachloroethylene	ND	0.070	mg/L	0.00083
Trichloroethylene	ND	0.050	mg/L	0.00041
Vinyl chloride	ND	0.025	mg/L	0.00044

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(86 - 125)
1,2-Dichloroethane-d4	108	(80 - 122)
Toluene-d8	113	(90 - 122)
4-Bromofluorobenzene	100	(84 - 125)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

QC DATA ASSOCIATION SUMMARY

G5H090184

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	SW846 8260B	P522403	5226055	5226018

METHOD BLANK REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5H090184 **Work Order #...:** HHEQ71AA **Matrix.....:** SOLID
MB Lot-Sample #: A5H120000-032
Leach Date.....: 08/11/05 **Prep Date.....:** 08/14/05 **Analysis Date..:** 08/14/05
Leach Batch #..: P522403 **Prep Batch #...:** 5226055
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.025	mg/L	SW846 8260B
Carbon tetrachloride	ND	0.025	mg/L	SW846 8260B
Chlorobenzene	ND	0.025	mg/L	SW846 8260B
Chloroform	ND	0.025	mg/L	SW846 8260B
1,2-Dichloroethane	ND	0.025	mg/L	SW846 8260B
1,1-Dichloroethylene	ND	0.070	mg/L	SW846 8260B
Methyl ethyl ketone	ND	0.25	mg/L	SW846 8260B
Tetrachloroethylene	ND	0.070	mg/L	SW846 8260B
Trichloroethylene	ND	0.050	mg/L	SW846 8260B
Vinyl chloride	ND	0.025	mg/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(86 - 125)
1,2-Dichloroethane-d4	108	(80 - 122)
Toluene-d8	111	(90 - 122)
4-Bromofluorobenzene	102	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5H090184 **Work Order #...:** HHH1K1AA **Matrix.....:** SOLID
LCS Lot-Sample#: A5H140000-055
Prep Date.....: 08/14/05 **Analysis Date..:** 08/14/05
Prep Batch #...: 5226055
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Benzene	**94**	**(76 - 118)**	**SW846 8260B**
Chlorobenzene	**96**	**(76 - 113)**	**SW846 8260B**
1,1-Dichloroethylene	**90**	**(67 - 128)**	**SW846 8260B**
Trichloroethylene	**93**	**(76 - 119)**	**SW846 8260B**
Toluene	**102**	**(72 - 117)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(86 - 124)
1,2-Dichloroethane-d4	115	(80 - 122)
Toluene-d8	112	(90 - 122)
4-Bromofluorobenzene	108	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5H090184 **Work Order #...:** HHH1K1AA **Matrix.....:** SOLID
LCS Lot-Sample#: A5H140000-055
Prep Date.....: 08/14/05 **Analysis Date..:** 08/14/05
Prep Batch #...: 5226055
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	**0.500**	**0.468**	**mg/L**	**94**	**SW846 8260B**
Chlorobenzene	**0.500**	**0.480**	**mg/L**	**96**	**SW846 8260B**
1,1-Dichloroethylene	**0.500**	**0.450**	**mg/L**	**90**	**SW846 8260B**
Trichloroethylene	**0.500**	**0.464**	**mg/L**	**93**	**SW846 8260B**
Toluene	**0.500**	**0.510**	**mg/L**	**102**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(86 - 124)
1,2-Dichloroethane-d4	115	(80 - 122)
Toluene-d8	112	(90 - 122)
4-Bromofluorobenzene	108	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5H090184 **Work Order #...:** HG84J1C5-MS **Matrix.....:** SOLID
MS Lot-Sample #: A5H100179-001 HG84J1C6-MSD
Date Sampled...: 08/09/05 **Date Received..:** 08/09/05
Leach Date.....: 08/11/05 **Prep Date.....:** 08/14/05 **Analysis Date..:** 08/14/05
Leach Batch #..: P522403 **Prep Batch #...:** 5226055
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**93**	**(76 - 117)**			**SW846 8260B**
	100	**(76 - 117)**	**6.9**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**95**	**(72 - 114)**			**SW846 8260B**
	99	**(72 - 114)**	**4.4**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethylene	**90**	**(67 - 129)**			**SW846 8260B**
	98	**(67 - 129)**	**8.0**	**(0-30)**	**SW846 8260B**
Trichloroethylene	**88**	**(72 - 121)**			**SW846 8260B**
	97	**(72 - 121)**	**9.0**	**(0-30)**	**SW846 8260B**
Toluene	**97**	**(67 - 113)**			**SW846 8260B**
	101	**(67 - 113)**	**3.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(86 - 125)
	114	(86 - 125)
1,2-Dichloroethane-d4	112	(80 - 122)
	118	(80 - 122)
Toluene-d8	111	(90 - 122)
	115	(90 - 122)
4-Bromofluorobenzene	104	(84 - 125)
	111	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5H090184 **Work Order #...:** HG84J1C5-MS **Matrix.....:** SOLID
MS Lot-Sample #: A5H100179-001 HG84J1C6-MSD
Date Sampled...: 08/09/05 **Date Received..:** 08/09/05
Leach Date.....: 08/11/05 **Prep Date.....:** 08/14/05 **Analysis Date..:** 08/14/05
Leach Batch #..: P522403 **Prep Batch #...:** 5226055
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**0.500**	**0.464**	**mg/L**	**93**		**SW846 8260B**
	ND	**0.500**	**0.498**	**mg/L**	**100**	**6.9**	**SW846 8260B**
Chlorobenzene	**ND**	**0.500**	**0.474**	**mg/L**	**95**		**SW846 8260B**
	ND	**0.500**	**0.495**	**mg/L**	**99**	**4.4**	**SW846 8260B**
1,1-Dichloroethylene	**ND**	**0.500**	**0.451**	**mg/L**	**90**		**SW846 8260B**
	ND	**0.500**	**0.489**	**mg/L**	**98**	**8.0**	**SW846 8260B**
Trichloroethylene	**ND**	**0.500**	**0.442**	**mg/L**	**88**		**SW846 8260B**
	ND	**0.500**	**0.484**	**mg/L**	**97**	**9.0**	**SW846 8260B**
Toluene	**ND**	**0.500**	**0.487**	**mg/L**	**97**		**SW846 8260B**
	ND	**0.500**	**0.503**	**mg/L**	**101**	**3.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(86 - 125)
	114	(86 - 125)
1,2-Dichloroethane-d4	112	(80 - 122)
	118	(80 - 122)
Toluene-d8	111	(90 - 122)
	115	(90 - 122)
4-Bromofluorobenzene	104	(84 - 125)
	111	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

APPENDIX H

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: **Dean Reynolds, TEAD; Larry McFarland, TEAD**

Copy: **Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons**

From: **Amanda Evans, Parsons**

Date: **Friday, September 2, 2005**

Subject: **TEAD SWMU-58 RFI – Waste Management**

This letter is to recommend disposition of the waste equipment rinsate and drill produced water in Baker Tank PARSNZ0520801 as detailed in Table One, attached.

The equipment rinsate and drill produced water was sampled as IDW61 and tested for VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC) summary. Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

Naphthalene was detected at 0.31 ug/L, toluene at 0.44 ug/L and trichloroethylene at 48 ug/L. Therefore it is recommended that the waste be treated as hazardous and coded F001 and F005. Also, chloroform was detected at 0.13 ug/L. No additional waste codes are recommended due to chloroform.

Characteristic Wastes Analysis:

The waste is known to be primarily water. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No analytes were detected in excess of TCLP limits. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No compounds were detected in excess of LDR limits for wastewater (40 CFR Part 268.48), therefore the waste is suitable for land disposal.

Disposition:

It is recommended that the equipment rinsate and drill produced water be sent to Clean Harbors and landfilled under the active profile number: CH91899B. No additional profile sampling will be required if this facility is utilized. Parsons will arrange to dispose of the waste per your written instructions.

Table One

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0520801	KLA	YES		6500 GAL	C-45, C-47, C-48F	PURGE WATER, DECON WATER	7/27/2005	8/18/2005	7/27/2005	**10/15/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-45	UID-90	7/27/2005		
C-47				
C-48				
UID				

From: McFarland, Larry [larry.mcfarland@us.army.mil]
Sent: Wednesday, September 07, 2005 3:23 PM
To: Evans, Amanda
Cc: Alloway, Kurt; Dean Reynolds (TEAD)
Subject: RE: TEAD IDW Report for IDW61
Amanda,

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated September 2, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW-61. TEAD concurs with Parsons recommended disposition. Water contained in the Baker Tank (PARSNZ0520801) should be disposed of off-site as recommended by Parsons as soon as possible. A copy of the shipping documents should be provided to TEAD for review prior to pickup by the transporter.

Larry McFarland
Environmental Office, SJMTE-CS-EO
1 Tooele Army Depot, Building 8
Tooele, Utah 84074-5003
Phone (435) 833-3235 Fax (435) 833-2839
larry.mcfarland@us.army.mil

-----Original Message-----
From: Evans, Amanda [mailto:Amanda.Evans@parsons.com]
Sent: Friday, September 02, 2005 10:54 AM
To: Kurt.Alloway@parsons.com; colec@emh2.tooele.army.mil; doug.d.mackenzie@usace.army.mil; Richard.Jirik@parsons.com; Maryellen.Mackenzie@usace.army.mil; mcfarlal@emh2.tooele.army.mil; reynoldd@emh2.tooele.army.mil
Subject: TEAD IDW Report for IDW61

Hello,

You will find attached the reports for IDW61. Please contact me if you have any questions or comments.

Thank you,

Amanda M. Evans
Chemist
parsons
406 West South Jordan Parkway, Suite 300
South Jordan, UT 84095
(801)553-3366
(801)572-9069 Fax

<<AME_idw61.pdf>>

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

August 29, 2005

STL SACRAMENTO PROJECT NUMBER: G5H240240
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on August 24, 2005. This sample is associated with your Tooelle IDW project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were sent via e-mail on August 29, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5H240240

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5H240240

General Comments

Sample: 1

Sample was received in good condition at STL Sacramento at 4 degrees C.

Water, SW 8260B, Volatile Organics

Sample(s): 1

Sample was analysed by method SW 8260B, gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met except as noted below.

Sample(s): 1

Insufficient volume was available for MS/MSD. An LCS/DCS was prepared instead.

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5H240240

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HH53T	1	IDW61	8/23/2005 02:05 PM	8/24/2005 09:05 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

CHAIN OF CUSTODY

PARSONS

COC ID: 1022

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW61	IDW61	WW	G	N	1	23AUG05	1405	KGA	—	—	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS	1	3			

Remarks: PARSN20520801

5 DAY TURN-AROUND REQUESTED

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	23AUG05 / 1500		8/24/05 1005

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, August 18, 2005

SEVERN TRENT STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NL LOG # 34227

LOT# (QUANTIMS ID) G5H240240 QUOTE# 62837 LOCATION VB

	Initials	Date
DATE RECEIVED 8/24/05 TIME RECEIVED 0905	CN	8/24/05

DELIVERED BY ☒ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☒ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) See 1

SHIPPPING CONTAINER(S) ☒ STL ☐ CLIENT ☐ N/A

TEMPERTURE RECORD (IN °C) IR 1 ☒ 3 ☐ ☐ OTHER _____

COC #(S) N/A

TEMPERATURE BLANK Observed: N/A Corrected: N/A

SAMPLE TEMPERATURE

Observed: 5 5 3 Average: 4 Corrected Average: 4

COLLECTOR'S NAME: ☐ Verified from COC ☒ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☒ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW _____ ☒ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING
WETCHEM ☒ N/A
VOA-ENCORES ☒ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☒ N/A

☒ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☒ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

WATER, 8260B, Volatile Organics

Parsons Corporation

Client Sample ID: IDW61

GC/MS Volatiles

Lot-Sample #...: G5H240240-001 **Work Order #...:** HH53T1AA **Matrix.....:** WATER
Date Sampled...: 08/23/05 **Date Received..:** 08/24/05
Prep Date.....: 08/25/05 **Analysis Date..:** 08/25/05
Prep Batch #...: 5238494
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.13 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	**0.31 J**	**1.0**	**ug/L**	**0.15**
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	**0.44 J**	**1.0**	**ug/L**	**0.25**
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**48**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	96	(70 - 130)
1,2-Dichloroethane-d4	111	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	109	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

QC DATA ASSOCIATION SUMMARY

G5H240240

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8260B		5238494	

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5H240240 **Work Order #...:** HJDWM1AA **Matrix.....:** WATER
MB Lot-Sample #: G5H260000-494

Prep Date.....: 08/25/05
Analysis Date..: 08/25/05 **Prep Batch #...:** 5238494
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	96	(70 - 130)
1,2-Dichloroethane-d4	112	(70 - 130)
Toluene-d8	103	(70 - 130)
Dibromofluoromethane	108	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5H240240 **Work Order #...:** HJDWM1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5H260000-494 HJDWM1AD-LCSD
Prep Date.....: 08/25/05 **Analysis Date..:** 08/25/05
Prep Batch #...: 5238494
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Chlorobenzene	**20.0**	**19.4**	**ug/L**	**97**		**SW846 8260B**
	20.0	**17.9**	**ug/L**	**90**	**8.0**	**SW846 8260B**
Benzene	**20.0**	**19.3**	**ug/L**	**96**		**SW846 8260B**
	20.0	**17.9**	**ug/L**	**90**	**7.2**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**20.1**	**ug/L**	**101**		**SW846 8260B**
	20.0	**17.9**	**ug/L**	**90**	**11**	**SW846 8260B**
Toluene	**20.0**	**18.9**	**ug/L**	**94**		**SW846 8260B**
	20.0	**17.5**	**ug/L**	**88**	**7.4**	**SW846 8260B**
Trichloroethene	**20.0**	**18.9**	**ug/L**	**95**		**SW846 8260B**
	20.0	**17.4**	**ug/L**	**87**	**8.4**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	106	(70 - 130)
	109	(70 - 130)
Toluene-d8	103	(70 - 130)
	106	(70 - 130)
Dibromofluoromethane	105	(70 - 130)
	106	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5H240240 **Work Order #...:** HJDWM1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5H260000-494 HJDWM1AD-LCSD
Prep Date.....: 08/25/05 **Analysis Date..:** 08/25/05
Prep Batch #...: 5238494
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Chlorobenzene	**97**	**(80 - 120)**			**SW846 8260B**
	90	**(80 - 120)**	**8.0**	**(0-30)**	**SW846 8260B**
Benzene	**96**	**(80 - 120)**			**SW846 8260B**
	90	**(80 - 120)**	**7.2**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**101**	**(80 - 120)**			**SW846 8260B**
	90	**(80 - 120)**	**11**	**(0-30)**	**SW846 8260B**
Toluene	**94**	**(80 - 120)**			**SW846 8260B**
	88	**(80 - 120)**	**7.4**	**(0-30)**	**SW846 8260B**
Trichloroethene	**95**	**(80 - 120)**			**SW846 8260B**
	87	**(80 - 120)**	**8.4**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	106	(70 - 130)
	109	(70 - 130)
Toluene-d8	103	(70 - 130)
	106	(70 - 130)
Dibromofluoromethane	105	(70 - 130)
	106	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. CH91899B

A. GENERAL INFORMATION

GENERATOR EPA ID # *UT3213820894*
GENERATOR CODE (Assigned by Clean Harbors) *TO0469*
ADDRESS *Tooele Army Depot*

GENERATOR PROFILE No. **CH91899B**
GENERATOR NAME *Tooele Army Depot*
CITY *Tooele* STATE *UT* ZIP *84074*
PHONE:

CUSTOMER CODE (Assigned by Clean Harbors) *PAR1392*
ADDRESS *406 W South Jordan Parkway Suite 300*

CUSTOMER NAME: *Parsons Engineering Science In*
CITY *South Jordan* STATE *UT* ZIP *84095*

B. WASTE DESCRIPTION

WASTE DESCRIPTION: *PURGE AND DECON WATER*

PROCESS GENERATING WASTE (Please provide detailed description of process generating waste):
DRILLING AND PURGEING WELLS

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- ☑ LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
  - % FREE LIQUID
  - % SETTLED SOLID
  - % TOTAL SUSPENDED SOLI
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS
☑ 1 2 3
% BY VOLUME (Approx.)
TOP
MIDDLE
BOTTOM

VISCOSITY (If liquid present)
☑ 1 - 100 (e.g. WATER)
101 - 500 (e.g. MOTOR OIL)
501 - 10,000 (e.g. MOLASSES)
> 10,000

COLOR
CLEAR

ODOR
☑ NONE
MILD
STRONG
Describe:

BOILING POINT
<= 95 °F
> 95 °F
101 - 129 °F
☑ >= 130 °F

MELTING POINT
< 140 °F
140-200 °F
> 200 °F

TOTAL ORGANIC CARBON
☑ <= 1%
1-9%
>= 10%

FLASH POINT
< 73 °F
73 - 100 °F
101 -140 °F
141 -200 °F
☑ > 200 °F
Actual:

pH
<= 2
2.1 - 6.9
☑ 7 (Neutral)
7.1 - 12.4
>= 12.5
Actual:

SPECIFIC GRAVITY
< 0.8 (e.g. Gasoline)
0.8-1.0 (e.g. Ethanol)
☑ 1.0 (e.g. Water)
1.0-1.2 (e.g. Antifreeze)
> 1.2 (e.g. Methylene Chloride)

ASH
< 0.1
0.1 - 1.0
1.1 - 5.0
5.1 - 20.0
> 20
Unknown
Actual:

BTU/LB
☑ < 2,000
2,000-5,000
5,000-10,000
> 10,000
Actual

VAPOR PRESSURE (for liquids only) : mm Hg

D. COMPOSITION (List the complete composition of the waste, include any inert components and /or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN - MAX	UOM
BENZENE	0.000 – 139.000	PPB
CARBON TETRACHLORIDE	0.000 – 56.000	PPB
CHLOROFORM	0.000 – 45.000	PPB
ETHYLBENZENE	0.000 – 56.000	PPB
NAPHTHALENE	0.000 – 58.000	PPB
TETRACHLOROETHANE	0.000 – 55.000	PPB
TOLUENE	0.000 – 79.000	PPB
TRICHLOROETHENE	0.000 – 53.000	PPB
WATER	99.000 – 100.000	%
Xylene (Mixed Isomers	0.000 – 319.000	PPB

CHEMICAL	MIN - MAX	UOM
— NO CODE		

ANY METAL OBJECTS PRESENT? YES ☑ NO
If yes include dimension

Clean Harbors Profile No. CH91899B

E. CONSTITUENTS -- Are these values based on testing or knowledge? ☐ Knowledge ☑ Testing

If constituent concentrations are base on analytical testing, analysis must be provided. If based on knowledge, basis of knowledge must be provided below.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D004	ARSENIC	5.0		
D005	BARIUM	100.0		
D006	CADMIUM	1.0		
D007	CHROMIUM	5.0		
D008	LEAD	5.0		
D009	MERCURY	0.2		
D010	SELENIUM	1.0		
D011	SILVER	5.0		

RCRA	VOLATILE COMPOUND	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D018	BENZENE	0.5		
D019	CARBON TETRACHLORIDE	0.5		
D021	CHLOROBENZENE	100.0		
D022	CHLOROFORM	6.0		
D028	1,2-DICHLOROETHANE	0.5		
D029	1,1-DICHLOROETHYLENE	0.7		
D035	METHYL ETHYL KETONE	200.0		
D039	TETRACHLOROETHYLENE	0.7		
D040	TRICHLOROETHYLENE	0.5		
D043	VINYL CHLORIDE	0.2		

RCRA	SEMI-VOLATILE COMPOUND	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D023	o-CRESOL	200.0		
D024	m-CRESOL	200.0		
D025	p-CRESOL	200.0		
D026	CRESOL (TOTAL)	200.0		
D027	1,4-DICHLOROBENZENE	7.5		
D030	2,4-DINITROTOLUENE	0.13		
D032	HEXACHLOROBENZENE	0.13		
D033	HEXACHLOROBUTADIENE	0.5		
D034	HEXACHLOROETHANE	3.0		
D036	NITROBENZENE	2.0		
D037	PENTACHLOROPHENOL	100.0		
D038	PYRIDINE	5.0		
D041	2,4,5-TRICHLOROPHENOL	400.0		
D042	2,4,6-TRICHLOROPHENOL	2.0		

RCRA	PESTICIDES AND HERBICIDE	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D012	ENDRIN	0.02		
D013	LINDANE	0.4		
D014	METHOXYCHLOR	10.0		
D015	TOXAPHENE	0.5		
D016	2,4-D	10.0		
D017	2,4,5-TP (SILVEX)	1.0		
D020	CHLORDANE	0.03		
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008		

OTHER METALS	MIN	MAX	UOM
ALUMINUM			
ANTIMONY			
BERYLLIUM			
CALCIUM			
COPPER			
MAGNESIUM			
MOLYBDENUM			
NICKEL			
POTASSIUM			
SILICON			
SODIUM			
THALLIUM			
TIN			
VANADIUM			
ZINC			

NON-METALS	MIN	MAX	UOM
BROMINE			
CHLORINE			
FLUORINE			
IODINE			
SULFUR			

OTHER NON-METALS	MIN	MAX	UOM
AMMONIA			
REACTIVE SULFIDE			
CYANIDE TOTAL			
CYANIDE AMENABLE			
CYANIDE REACTIVE			

OTHER CHEMICALS	MIN	MAX	UOM
PHENOL			
Total Petroleum Hydrocarbons			

OTHER

HOCs

☐ NONE
☑ < 1000 PPM
☐ >= 1000 PPM

PCBs

☑ NONE
☐ <50 PPM
☐ >= 50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

YES ☑ NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES ☑ NO (If yes, explain)

ASBESTOS	INFECTIOUS, PATHOGENIC, OR ETIOLOGICAL AGENT	REDUCING AGENT
DEA REGULATED SUBSTANCES	OXIDIZER	SHOCK SENSITIVE
DIOXIN	OSHA REGULATED CARCINOGENS	SPONTANEOUSLY IGNITES WITH AIR
EXPLOSIVE	PESTICIDE	THERMALLY SENSITIVE
HERBICIDE	POLYMERIZABLE	WATER REACTIVE
FUMING / SMOKING WASTE	RADIOACTIVE	
NONE OF THE ABOVE		

Clean Harbors Profile No. CH91899B

F. REGULATORY STATUS

☑ YES NO USEPA HAZARDOUS WASTE?
F001 F002 F003 F005

YES ☑ NO DO ANY STATE WASTE CODES APPLY?

YES ☑ NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
LDR CATEGORY:
VARIANCE INFO:

☑ YES NO IS THIS A WASTEWATER PER 40 CFR PART 268.2?

YES ☑ NO IF ANY WASTE CODES D001, D002, D003 (OTHER THAN REACTIVE CYANIDE OR REACTIVE SULFIDE), D004-D011, D012-D017 NON-WASTEWATERS, OR D018-D043 APPLY, ARE ANY UNDERLYING HAZARDOUS (UHCs) PRESENT ABOVE UNIVERSAL TREATMENT

YES ☑ NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES ☑ NO IS THIS WASTE SUBJECT TO CATEGORICAL PRETREATMENT DISCHARGE STANDARDS?
IF YES, SPECIFY POINT SOURCE CATEGORY LISTED IN 40 CFR PART 4

YES ☑ NO IS THIS WASTE REGULATED UNDER THE BENZENE NESHAP RULES? (IS THIS WASTE FROM A CHEMICAL MANUFACTURING, COKE BY-PRODUCT RECOVERY, OR PETROLEUM REFINERY PROCESS?)

YES ☑ NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

YES ☑ NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

☑ YES NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE GREATER THAN 77 KPa (11.2PSIA)?

YES ☑ NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?

G. D.O.T INFORMATION: (Include proper shipping name, hazard class and ID number).
US D.O.T. DESCRIPTION: *Hazardous waste, liquid, n.o.s., (TRICHLOROETHENE, TETRACHLOROETHENE) , 9, NA3082, PG III*

H. TRANSPORTATION REQUIREMENTS
ESTIMATED SHIPMENT FREQUENCY: ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY ☑ OTHER *VARIES*
IF BULK LIQUID OR BULK SOLID PLEASE INICATE THE EXPECTED NUMBER OF LOADS PER SHIPPING FREQUENCY

CONTAINERIZED	☑ BULK LIQUID	BULK SOLID
CONTAINERS/SHIPMENT	GALLONS/SHIPMENT: GAL.	SHIPMENT UOM: TON YARD
STORAGE CAPACITY:	FROM TANKS: TANK SIZE GAL.	PER SHIPMENT: 0.00 MIN 0.00MAX
CONTAINER TYPE:	FROM DRUMS	STORAGE CAPACI TON/YD
CUBIC YARD BOX	VEHICLE TYPE:	VEHICLE TYPE:
PALLET	VAC TRUCK	DUMP TRAILER
TOTE TANK	☑ TANK TRUCK	ROLL OFF BOX
OTHER:	RAILROAD TANK CAR	INTERMODAL ROLLOFF BOX
DRUM SIZE:	CHECK COMPATIBLE STORAGE MATERIAL	CUSCO/VACTOR
CONTAINER MATERIAL:	☑ STEEL / STAINLESS STEEL	OTHER
STEEL	RUBBER LINED / FIBERGLASS LINED	
FIBER	DERAKANE	
PLASTIC	OTHER	
OTHER		

I. SPECIAL REQUEST
SPECIFIC DISPOSAL RESTRICTIONS OR REQUESTS: *LANDFILL GRASSY MOUNTAIN / MEETS TREATMENT STANDARDS*
SPECIAL WASTE HANDLING REQUIREMENTS
OTHER COMMENTS OR REQUESTS:

J. BIENNIAL / ANNUAL REPORTING INFORMATION
SIC CODE *9711* SOURCE CODE *A63* FORM CODE *B101* ORIGIN CODE *NA*

K. SAMPLE STATUS

	YES	SAMPLED BY	DATE SAMPLED	WHERE SENT
REPRESENTATIVE SAMPLE HAS BEEN SUPPLIE	☑ NO			

GENERATORS CERTIFICATION

I here by certify that all information submitted in this and attached documents is correct to the best of my knowledge. I also certify that any samples submitted are representative of the actual waste. If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE	NAME (PRINT)	TITLE	DATE
Merle D Reynolds	Merle D Reynolds	Env Prof Spec	3/9/05

FOR CLEAN HARBORS USE ONLY
CHI REPRESENTATIVE COMPLETING PROFILE:_____

09100212
PFW/08/25/2005

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. UT3213820891 Manifest Document No. PS013 2. Page 1 of 1 Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
Tooele Army Depot
ATTN: Dean Reynolds
Tooele Army Depot Environmental Office, SMTE-, DS-EO Building 6
Tooele, UT 84074
4. Generator's Phone (435) 833-3604

A. State Manifest Document Number
B. State Generator's ID Tooele Army Depot Tooele, UT 84074

5. Transporter 1 Company Name
MP Environmental Services
6. US EPA ID Number UTD980629247
C. State Transporter's ID
D. Transporter's Phone (801) 393-1151

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Clean Harbors Grassy Mountain
3 Miles East 7 Miles North of Knolls
Clive, UT, 84029
10. US EPA ID Number UTD981301718
G. State Facility's ID
H. Facility's Phone (801) 323-8666

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. HAZARDOUS WASTE, LIQUID, N.O.S., (TRICHLOROETHENE, TETRACHLOROETHENE), 9, NA3082, PG III	X				T	F001 F002 F003 F005
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
EMERGENCY PHONE TOOELE ARMY DEPOT FIRE DEPT (435) 833-2115

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name [illegible] Signature [illegible] Month 09 Day 20 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name Signature Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name Signature Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name Signature Month Day Year

I. Mark Francis has the appropriate permits for and has accepted the waste this generator is shipping.

FILE COPY OR STATE COPY

CleanHarbors
ENVIRONMENTAL SERVICES, INC.

Land Disposal Restriction Notification Form

Date: 09 / 14 / 2005

MANIFEST INFORMATION

Generator: Tooele Army Depot
Address: Tooele Army Depot
Tooele, UT 84074
EPA ID#: UT3213820894

Manifest No

Sales Order No: D91022123
Manifest Document No: P5013

LINE ITEM INFORMATION

Line Item:	Page No:	Profile No:	Treatability Group:	LDR Disposal Category:
11a	1	CH91899B	WASTEWATER	2 : This is subject to LDR.

EPA Waste Codes
F001 F002 F003 F005

EPA Waste Subcategory
NONE

LDR Chemical Data

Chemical	Underlying Hazardous Constituents	Constituents of Concern	Contaminants Subject to Treatment
BENZENE	N	Y	N
CHLOROFORM	N	Y	N
ETHYL BENZENE	N	Y	N
TETRACHLOROETHYLENE	N	Y	N
TOLUENE	N	Y	N
TRICHLOROETHYLENE	N	Y	N

Certification

Applies to Manifest Line Items

Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. **11a**

Waste analysis data, where available, is attached

Signature: Larry McFarland
Print Name: Larry McFarland

Title: Program Manager
Date: 9-20-05